AIR CONDITIONING
HEATING & REFRIGERATION
The Newspaper of the Industry
RESIDENTIAL — COMMERCIAL — INDUSTRIAL

# NEWS

November 2, 1959

Issued every Monday at
450 West Fort St., Detroit 26, Michigan
Established 1926

Member, Associated Business Publications — Member, Audit Bureau of Circulations

Vol. 88, No. 9, Serial No. 1,597
Trade Mark Registered U.S. Patent Office. Copyright 1959, by Business News Publishing Co.
Subscription Price, $6 Per Year (U. S. and Canada). Foreign: $10.00 Per Year.
Reentered as second class matter October 3, 1936, at the post office at Detroit, Mich., under the Act of March 3, 1879.

## Inside Dope

By GEORGE F. TAUBENECK

*Learn to live and laugh — thus delay your epitaph*

**Stories of the Week**
**Thoughts for This Week**
**Sense of Humor, Too**
**Air Conditioned Air Is Fresher**
**Refrigeration Note**
**Add Newspaper Laughs**
**Diplomatic Salesman**
**Amen, Brother Neubauer!**

### *Stories of the Week*

Seatmates on a commercial airplane included America's biggest TV comedian and a home appliance dealer. They exchanged names pleasantly.

"What business you in?" followed up the dealer.

"Why," exclaimed the shocked TV star, "I'm in television."

"Wholesale or retail?"

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A do-it-yourselfer was trying to refit an out-of-plumb door.

"Johnnie," he called out to his 12-year-old son, "bring me a screwdriver."

Five minutes passed.

"Johnnie! Where's that screwdriver?"

"Sorry, Dad. I have the vodka, but I can't find any orange juice."

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### *Thoughts for This Week*

Goodwill is one asset that competition never can steal from you.

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The happier we are when we look at life, the less gruesome will it be when it looks at us.

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Anyone who thinks he knows all the answers isn't up-to-date on the questions.

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### *Sense of Humor, Too*

May we expect long-range, big-scale control of the weather? U.S.S.R. Prof. Aleksandr M. Obukhov, director of the Soviet Institute of Physics of the Atmosphere, has just announced:

"For the forseeable future, the best scientific device in this field will be the umbrella."

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### *Air Conditioned Air Is Fresher*

Referring to the convertible auto, which has been described as a "man's wish fulfillment symbol for unrequited sex," William Capitman (president of the New York Center for Social Research) corrects:

"The man who drives a convertible may not want a mistress at all. He may simply enjoy driving in fresh air."

*(Continued on Page 18, Col. 1)*

**BULLETIN**

## *10% Tax Put on All Room Units Effective Dec. 1*

WASHINGTON, D. C. — The 10% excise tax on all room air conditioners will be in effect Dec. 1.

The U. S. Treasury Department pushed through the publication of its new regulation in the *Federal Register* on Oct. 30, it was learned as this issue of the NEWS went to press. Publication of the final draft of the new regulation had to be done before Nov. 1 if it was to become effective Dec. 1.

Up to now, the tax had

*(Concluded on Page 72, Col. 5)*

# Industry Readies '60 Wares To Top Record-Breaking '59 Sales

## Home Cooling Sales Soar In Wichita

*By C. Dale Mericle*

WICHITA, Kan. — Sales of residential air conditioning hit an all-time high here this year, topping the record set in 1957.

Indications are that approximately 1,350 units were sold during 1959 (through Oct. 10), compared to 1,307 in 1957 and an estimated 1,100 in 1958.

Sales would have been even greater this year, according to some contractors, had the weather been warmer in June. Unseasonable cold weather held back early summer sales, but some of these "losses" were probably picked up during the exceptional hot spell in August.

In making its sixth annual survey of Wichita sales, AIR CONDITIONING, HEATING & REFRIGERATION NEWS obtained data

*(Continued on Page 22, Col. 1)*

## *Industry Prices Seen Rising Only If Materials Do*

DETROIT—Are prices of the industry's products headed higher in 1960?

So far, there's little concrete evidence that they are. In some of the new lines announced thus far this year, prices to distributors (which are "off the record") have held the line and in some models were lower than comparable '59 prices.

A big increase in the cost of steel and other basic materials could change the picture. One leading manufacturer of a prime component has said that increases in steel costs up to $4 a ton might be absorbed, but that anything beyond that would have to be reflected in increased prices.

## Alter Style of '60 Carrier Line

SYRACUSE, N. Y. — The company's first major style change in four years; lighter, slimmer, and quieter models; larger capacities; and easier installation mark the 1960 room air conditioners announced by Carrier Corp.

Twenty models, most of them representing a complete rede-

*(Concluded on Page 73, Col. 3)*

## 'Engagement Rings' Are Beautiful— But Will He Really Marry You?

*(Conscience of the Industry Editorial by George F. Taubeneck)*

THERE'S GOOD NEWS currently about progress of this editorial page's campaign for honest standards and measurements—*and believable advertising of such*—in the air conditioning business.

Instance: The Air-Conditioning & Refrigeration Institute—upon *which* and upon *whose members* the success of this campaign depends for fruition—has revealed planned expansion of its "certification program" to include heat pumps.

Moreover, other as-yet-unannounced "certification programs" are in the works for cooling towers, heat exchangers, etc.—we hear *via* the grapevine.

THIS IS PROGRESS! COMMENDABLE!

ARI's heat pump certification guarantee will be based on a testing and rating procedure in accordance with ARI Standard 240—which its Unitary Section will revise to comply with requirements of the Underwriters' Laboratories and the American Standards Association.

Already in progress, ARI's "Honest Measurement program" for unitary air conditioners is promising, Period.

*(Concluded on page 38)*

### SHOW FACTS

**11th Exposition of the Air Conditioning and Refrigeration Industry, Nov. 2-5 at Convention Hall in Atlantic City. Show hours: 2 to 10 p.m. on Monday, Nov. 2; 10 a.m. to 6 p.m. on Tuesday and Wednesday; 10 a.m. to 4 p.m. on Thursday.**

**Exhibits by more than 200 manufacturers (See page 52). Special exhibits of air conditioned automobiles and by U.S. Defense Department. Special event: conference session at 9:30 a.m. Tuesday, Nov. 3, on stage of convention hall.**

## ARW Opens Door To Manufacturers

ATLANTIC CITY, N. J. — A change in the constitution of the Air-Conditioning & Refrigeration Wholesalers association will permit manufacturer suppliers to be invited into the ARW as associate members.

This was announced by Charles G. Koopman, ARW president, at the annual meeting here of the association of independent air conditioning and re-

*(Concluded on Page 72, Col. 5)*

## *'Pin Fin' Coil On Frigidaire Coolers*

DAYTON—New "stereo-cooling" and a new "Pin-Fin" cooling coil are highlighted in 1960 Frigidaire room air conditioners announced by Herman F. Lehman, General Motors vice president and Frigidaire Div. general manager.

Lehman said new "Imperial" models are equipped with a unique air discharge grille that directs conditioned air around room occupants instead of di-

*(Concluded on Page 72, Col. 1)*

## Janitrol Revamps Condensing Unit

COLUMBUS, Ohio—In a fast-moving, three-day get-together here, several hundred "Select Dealers" viewed new product lines and heard the merchandising plans for 1960 that have been programmed by Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.

Introduced was the re-engineered "52 series" outdoor condensing unit for split-system air conditioners and the new "67 series" of gas-fired unit heaters

*(Concluded on Back Page, Col. 1)*

ATLANTIC CITY, N. J. — With 1959 likely to wind up as the biggest year in history for the sale of mechanical cooling products, the 11th Exposition of the Air Conditioning & Refrigeration Industry opens its doors here Nov. 2 to a showing of products by manufacturers who have hopes that 1960 will see this record surpassed by a considerable margin.

There are some clouds on the horizon—the steel strike may slow up the filling of the pipelines of distribution, tighter money policies could result in construction cutbacks, cool weather next summer might hurt air conditioning sales.

But the industry's heavy selling season will be far enough into '60 that the steel strike may not hurt so much; the impetus of good times and the needs of a growing population should keep new construction high; and air conditioning has taken hold of the public's fancy to the extent that only really sub-normal weather in the mid-year could retard sales progress.

There would probably be little argument that from the standpoint of dollar volume, 1959 will record the highest dollar volume sales in history for mechanical cooling products. Perhaps in some categories of equipment unitary sales did not set new records, but where they didn't, they were very close. A product rundown shows:

**Central Residential Air Conditioners....200,000 units**

The reported figures on ARI production of unitary equipment, plus information gathered from

*(Concluded on Page 73, Col. 1)*

## IN THIS ISSUE

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## *Westinghouse Agrees To Consent Order In Discrimination Case*

WASHINGTON, D. C. — The Federal Trade Commission announced that Westinghouse Electric Corp., Pittsburgh, has agreed to an FTC consent order forbidding it to grant dealers discriminatory prices or advertising payments.

The commission affirmed Hearing Examiner John B. Poindexter's Aug. 31 order, to which both the company and the FTC's Bureau of Litigation had agreed, the announcement said.

The FTC issued its complaint on May 14, 1958, alleging that Westinghouse violated Sec. 2(a) of the Robinson-Patman Amendment to the Clayton Act by charging some dealers more than their competitors for the same electric appliances.

## Marley Ups Prices On Cooling Towers

KANSAS CITY, Mo. — The Marley Co. has announced an increase in the pricing structure of its cooling tower line.

"The upward trend in steel and labor costs can no longer be ignored," said Joseph A. Cameron, Marley president, in making the announcement. "We are not anticipating future costs; these advances are and have been present for some time.

"In an effort to hold prices to necessary minimums, we have carefully studied the cost of each tower model. New prices reflect only the increase in materials and labor required to produce each specific type rather than an across the board percentage raise."

Like most fabricators, Marley stockpiled steel in anticipation of the steel strike, but the prolonged shut down depleted their inventory.

To continue operation, according to Cameron, the company was forced to turn to higher-priced markets for its steel supply. Contracts with various unions for the next year also show uniform increases at the company's three manufacturing plants, it was noted.

### They Said It Couldn't Be Done

MIAMI BEACH, Fla. — They're air conditioning the outdoors down here.

At the Roney Plaza hotel, cool air from the Bamboo Room is directed to a new lanai that will allow 30 diners to sit on the air conditioned sidewalk under a palm-thatched awning and watch the Beach parade pass by.

*Detrimental Effects To Be Studied*

## Army Indefinitely Postpones Plans To Supply Troops with Irradiated Foods

WASHINGTON, D. C. — The Army announced at a Pentagon press conference that plans to supply troops with irradiated foods have been postponed indefinitely pending further research in high dose radiation sterilization of food.

Construction work on its irradiated food plant at Stockton, Calif., the Army said, has been suspended.

The Army had counted on irradiated foods as a successor to the frozen and dehydrated types now used. Chief advantages of such food would be to troops in the field where refrigeration was not available and in countries lacking refrigeration.

According to Army scientists, the plant-building suspension was ordered for two purposes:

1. To determine what strategic and tactical advantages could be gained from foods preserved by radiation.

2. To view more research in the light of the inconclusive but detrimental physical effects observed in some animals used in the program.

These effects reportedly included some loss of fertility in dogs; bleeding, lessening of longevity, and difficulty with vision in rats; and enlargement of heart in mice. Some of these symptoms may have been due to other causes, it was indicated.

Army spokesman said research so far and these detrimental effects were insufficient and too questionable to arrive at any conclusion relating to irradiated foods and human beings.

Richard S. Morse, director of research and development for the Army, presided over the news conference, which was attended by Army scientific and medical officials and a representative of the Atomic Energy Commission (AEC).

Morse said that although research work would continue, a decision to resume the project, started in 1953, was not likely for some time, if at all.

Some 100 persons, mainly conscientious objectors to Army service, had been used in irradiated food tests, it was reported. About 1,000 including high Army officials, Congressmen, and newsmen, have eaten irradiated meals for testing purposes, Army spokesmen indicated.

The scientists stressed, however, that no human beings had been given sufficient quantities of the food that might have endangered them, and that checkups had disclosed no indication of harmful effects.

Officials said no tests on humans have been conducted for a year.

In a separate statement, AEC said that it had no part in the plant-suspension decision and that Army research work had been on high dosage irradiation.

Both American and foreign testing, the agency emphasized, showed that low dosage irradiation (about one-tenth the strength of high dosage) for extending the shelf life of foods holds worthwhile promise for civilian use.

AEC also said cobalt 60 irradiation, the type used in Army tests, should find advantageous use in eventual commercial application.

Morse said private industry has shown little interest in high dosage radiation work. Major civilian and industrial interest is in low dosage work, according to the Army, and the technical and economic requirements for this type of treatment are not nearly so demanding.

**NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.**

Photo - ROYAL CASTLE COMMISSARY, MIAMI, FLA.

KRAMER Presents a New Evaporator Principle

B-R unit combines all the advantages of the gravity coil with the advantages of the fan type unit. The result of years of research and development, it is the evaporator that answers the problem when the installation requires that "extra" in performance.

**LOW AIR VELOCITY:** Discharge velocities are no higher than a gravity coil—there are no air blasts. Ideal for installations where people must work in a refrigerated room.

**NO DEAD AIR SPOTS:** By distributing the B-R units over the ceiling area, even temperature and humidity conditions can be maintained throughout the area.

**SPACE SAVER:** Fits between the rails without hindering the movement of the stored product; it takes no usable space.

**IDEAL FOR THE MEAT INDUSTRY:** The B-R unit has proven very successful in the refrigeration of fresh meat. Shrinkage is cut to an absolute minimum, slime and mold are controlled, and the bloom and flavor is maintained. Ideal for carcass chilling, meat cutting rooms, meat storage rooms, aging rooms, smoked meat storage as well as pork, bacon and sausage rooms, etc.

**MANY APPLICATIONS:** Can be furnished with a hot gas heated pan for temperatures below 30°. Available as an "F" or "L" THERMOBANK system with or without the compressor for temperatures of 32° or lower. The B-R designs include units for Refrigerant 12, Refrigerant 22 and ammonia.

**Write for Bulletin R-462**

KRAMER TRENTON CO. • Trenton 5, N.J.

# Climate by Chrysler

## gives you much more to sell than just coolness

Selling is easier when you offer Chrysler packaged air conditioning. You've got the largest selection of equipment in the industry at your command. And you've got more sales-building features to offer your customers.

**Consider the line.** Only Chrysler provides you with 292 combinations—including water-cooled and waterless equipment—in capacities from 3 to 45 tons. With this line, you'll never miss a job because you couldn't get the right unit. Your quotes will be consistently lower. And, you'll eliminate customer complaints about undersized or oversized equipment.

**Consider the features.** Your customers appreciate the extra value you'll give them: $364 worth of equipment like all-weather control and electronic motor control that are standard only on Chrysler Packaged Air Conditioning. And, they are already pre-sold on Chrysler's 25-year reputation for product quality, lower operating and service costs.

**Consider the profit.** With Climate by Chrysler, you'll sell more—and make more profit on what you sell. Chrysler engineering know-how saves you time and money on installation . . . and cuts service call-backs to almost nothing. Get the full story from your local Chrysler Airtemp Distributor . . . today!

CHRYSLER AIRTEMP

Airtemp Division, Chrysler Corporation, Dept. H-119, Dayton 1, Ohio
Canadian Distributor: Therm-O-Rite Products, Ltd., Toronto, Ontario

SEE OUR EXHIBIT
11th EXPOSITION AIR-CONDITIONING AND REFRIGERATION INDUSTRY
ATLANTIC CITY, N.J. NOV. 2-3-4-5 1959
BOOTHS 335-339

# NOW! *Copelametic* motor-compressor line extended through 30 H. P.

## Compact new Copelametics eliminate multiple compressor installations in larger package air conditioners

**New Copelametic motor-compressors up to 30 H.P. for package air conditioners are compact . . . less than 29 inches long with amazingly low cubic space requirements.**

**Nine models of this new series...both four and six cylinders . . . use Refrigerant 12 and Refrigerant 22 at 1750 R.P.M.**

| Model No. | Nom. H.P. | Application | Refrig. | Max. Load Conditions* |
|---|---|---|---|---|
| 4R48-756 | 7½ | Low Temp. | R-12 | C |
| 4R48-1006 | 10 | High Temp. | R-12 | A |
| 4R48-1506 | 15 | High Temp. | R-22 | B |
| 4R48-2006 | 20 | High Temp. | R-22 | A |
| 6R48-1006 | 10 | Low Temp. | R-12 | C |
| 6R48-1506 | 15 | High Temp. | R-12 | B |
| 6R48-2006 | 20 | High Temp. | R-12 | A |
| 6R48-2506 | 25 | High Temp. | R-22 | B |
| 6R48-3006 | 30 | High Temp. | R-22 | A |

*A.....50° F. Evaporating Temperature, 145° F. Condensing Temperature
B.....50° F. Evaporating Temperature, 115° F. Condensing Temperature
C..... 5° F. Evaporating Temperature, 130° F. Condensing Temperature

- Time-tested Copelametic accessibility permits fast field maintenance. Within the "Unibloc" body casting, all components are light in weight, easy to handle. Parts are completely interchangeable.
- Four large-size, fine-mesh suction gas strainers insure clean, dry gas to all cylinders.

### Lubrication System

- Automatically reversing positive displacement gear pump features internal pressure regulation. This provides positive pressure lubrication to journal and connecting rod bearings.
- Oil strainer is fabricated of extra-fine mesh with large screen area. Inverted pan design takes advantage of all oil in crankcase.
- Oil check valve permits quick return of oil to crankcase from suction chamber.
- Oil filter is located in return gas chamber for added protection.

### Running Gear

- Malleable iron crankshaft is statically and dynamically balanced to close tolerances.
- Cam ground pistons and rods are select aluminum alloy.
- Journal bearings are babbitt-on-steel inserts sized for high service loads.

### Motors

- Dual voltage design permits 208/220-volt across-the-line or part winding start, or 440 volts.

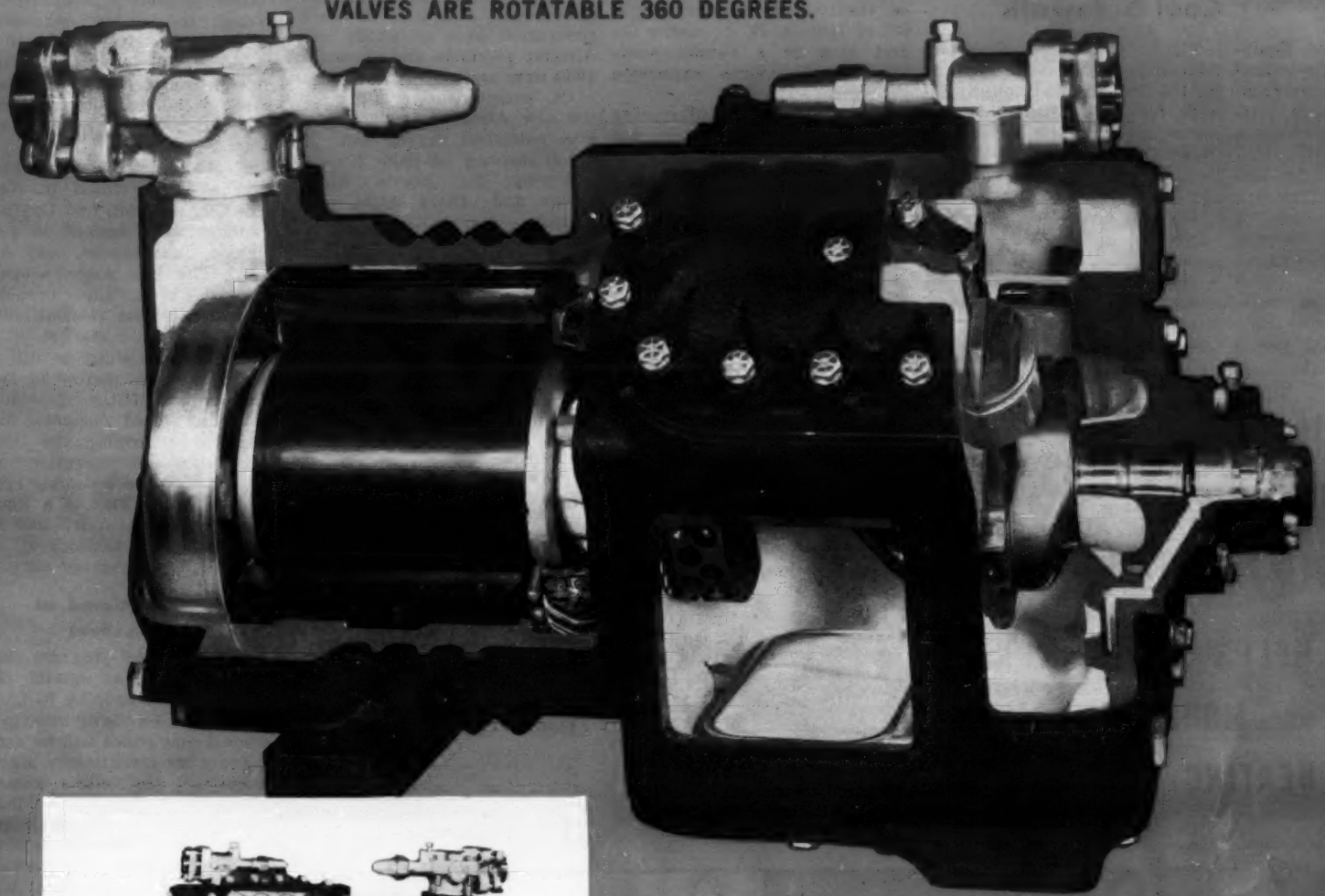
Package air conditioners equipped with Copelametic motor-compressors have a head start on competition. High capacity and easy maintenance are coupled with traditional Copeland dependability. Copelametics can be the big "plus" factor in your product sales story. Write for full information on the new, compact, four and six-cylinder Copelametics, or see them at Atlantic City, Booth 139-143.

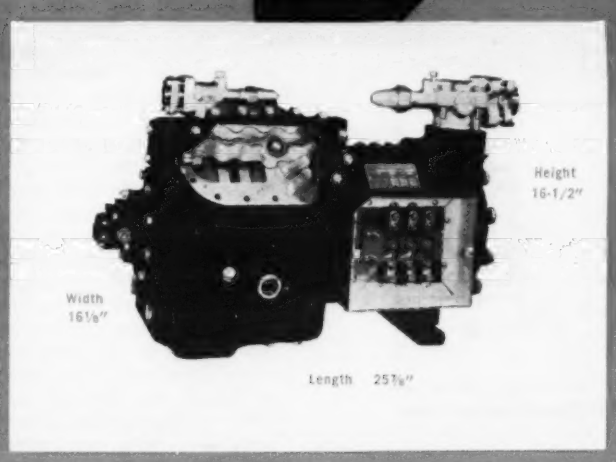
SINCE 1918

**Copeland REFRIGERATION CORPORATION, Sidn**

FOUR-POSITION SUCTION
VALVES ARE ROTATABLE 360 DEGREES.

TWO-POSITION DISCHARGE
VALVES ARE ROTATABLE 180 DEGREES.






**Sectional views Model 4R48.**

**DIMENSIONS**

| | Length | Width | Height |
|---|---|---|---|
| Four-cylinder models: | 25⅞" | 16⅛" | 16-1/2" |
| Six-cylinder 10 H.P.: | 27⅛" | 17⅛" | 18-9/16" |
| Six-cylinder 15, 20, 25 and 30 H.P.: | 28⅜" | 17⅛" | 17-19/32" |

# See these new higher H.P. Copelametics at Atlantic City — Booth 139-143 — *along with...*

**The New "W" line** of water-cooled Copelametic condensing units.

**The New "A" line** of air-cooled Copelametic condensing units.

**The New Copelaweld "4U" series,** four-cylinder, 1750 R.P.M. **welded hermetics** in 2½, 3, 3½ and 4 H.P. models for air conditioning and heat pumps.

*ey, Ohio*

# NCRSA Members Find Trade-Ins Profitable

PHILADELPHIA — Eighty-three per cent of commercial refrigeration distributors accepting trade-ins made a profit on used equipment sales in 1958, according to a recently issued report published by the National Commercial Refrigerator Sales Association.

The report on "Used Equipment Taken As Trade-Ins" covers allowances, reconditioning, inventory, evaluation, pricing, reselling, ratio to new sales, and profitability.

Information on their policies was supplied by 103 distributor members of the association. Of these 92% regularly accepted trade-ins on new equipment sales.

Of those who accepted trade-ins, 97% reconditioned the trade-ins for sale, 93% resold the equipment through their regular salesmen, 66% reported that 10% or more of 1958 sales were in used equipment, and 93% provided service on used equipment, 75% giving 90 days or more.

## Cool Sidewalk

TUCSON, Ariz. — Campbell Development Co. here is building the first air conditioned sidewalk for an Arizona shopping center, on N. Campbell Ave. between Glenn St. and Blacklidge Dr., it was reported here recently.

The sidewalk will run the full length of the 700-ft. building, covered by a 22-ft. wide canopy. A space 15 ft. wide will be enclosed with glass and air conditioned as a sidewalk. Entrances to the walk will be at short intervals.

## *Bendix Aviation To Cool New Plant*

HOLMDEL, N. J.—Construction of a new, air conditioned semiconductor products plant by the Bendix Aviation Corp. was started recently.

The 72,000-sq. ft. facility, to be constructed by the Austin Co. of Roselle, N. J., marks the first step in a Bendix semiconductor products expansion program.

It will house manufacturing facilities, marketing offices, and engineering and research laboratories.

The facility will be completely air conditioned, and will include a special humidity controlled area for the precise control of semiconductor production. Automatic gas generating equipment and an automatic water purification system also will be installed.

# Important Policy Declarations Made by Airtemp at Distributor Convention

DAYTON—Several important declarations of policy were made by Vice President Joseph B. Ogden and other officials of the Airtemp Div., Chrysler Corp., at the recent annual distributor convention here at which new Airtemp products and plans for 1960 were announced.

(A comprehensive story on the new Airtemp product lines was published in the Oct. 26 issue, starting on page 1.)

Among the points which Ogden and others made were these:

There will be no change in the current warranty policy. An extensive study was made on this question, and the Distributor Council was polled, and on the basis of the findings it was decided not to change the current warranty program.

### Airtemp 'Prefers To Use Independent Distributors'

Airtemp prefers to distribute through independent wholesalers, but where the wholesaler is not doing the job to get what Airtemp considers to be its fair share of the market, the company will not hesitate to set up a factory branch.

In the past year factory branches were closed in New York City, Detroit, and Dayton. Branches were opened in Los Angeles, Indianapolis, and Atlanta. The Los Angeles operation will be a "super-branch" charged with the responsibility of the California market.

An extensive study is still in progress on the matter of two separate distributor classifications that would recognize distributors performing the complete wholesale operation, as contrasted to the installing type of distributor. This is a long-range program that will not be put into actual practice all at one time, or by any one date.

### Ad Program Aimed at Specific Objectives

An advertising program that will be directed at specific objectives was outlined by Richard Routh, Jr., advertising manager. National magazines will be used for room air conditioners starting early in the selling season. National magazines and publications directed to homeowners will be used to promote central residential systems. Publications that influence businessmen will carry the message on Airtemp products designed for the commercial and industrial market.

The co-op program will continue with funds to be accumulated by directly franchised outlets on the basis of a percentage of net sales billed per month. To improve the effectiveness of advertising at the local level, an advertising and sales promotion workshop will be held early in 1960 at Dayton for distributor personnel who are concerned with the advertising program.

### Plan 'Certified Service Stations'

Factory directed "certified service stations" will be set up to assist in servicing operations in areas where dealers cannot provide adequate servicing. The company will not hesitate to police service operations among those dealers who do service, and will investigate customer complaints and will not hesitate to cancel a dealer's service franchise where a poor job is done.

In its approach to the commercial and industrial market, Airtemp has done a big revision of its written product information and specifications, and has developed new manuals designed to make the job easier on the "plan and specifications" type of prospective sale.

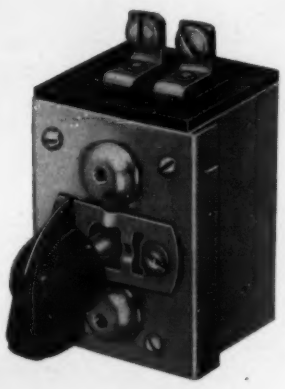
The leasing plan which was developed last year has been made easier to use, it was stated.

The "Risk Protection Plan" on inventories will embrace stocks held by qualified dealers, and will also provide price protection.


NEW WILCOLATOR TYPE G1

thermostat

HELPS YOU DESIGN MORE COMPACT HEATING CONTROLS



SINGLE-POLE, REMOTE-BULB UNIT COMBINES SMALL SIZE, HIGH CAPACITY, LOW COST

*Photo courtesy Electromode Division of Commercial Controls Corporation*

Combination of small size and high capacity offered by new Wilcolator G1 Thermostat is used to advantage in compact control panel of Electromode baseboard heater.

Because of its improved-design, snap-action switch mechanism, the new Wilcolator Type G1 Thermostat provides significantly higher contact ratings than were previously available in such a compact unit (2¾ x 1⅝ x 1⅞ in.). Thus you can utilize this new thermostat to design smaller, more efficient control panel assemblies for space heaters, ranges and similar appliances. At the same time, you can also reduce costs, because the G1 is generally priced lower than its bulkier counterparts.

The Wilcolator G1 Thermostat gives you accurate temperature control of practically any electrically heated medium—liquid, solid or gas—from 0 to 585°F. Its contacts are vibration proof and will not cause radio or TV interference. Temperature differential is adjustable and can be factory set to your specifications. Switch mechanism includes positive Off position.

For further information, write The Wilcolator Company, 1001 Newark Ave., Elizabeth, N.J. *In Canada:* Wilcolator (Canada) Ltd., 221 Evans Ave., Toronto 14, Ont. *Export:* Wilcolator, 1010 Schaff Bldg., 1505 Race St., Philadelphia 2, Pa.

SPECIFICATIONS

Temperature ranges: 0°F min.; 585°F max. Special temperature ranges: to customer's requirements

Contact rating: 30 amp, 125 and 250 volts a-c noninductive load

Standard shaft: ¼ in. diam. flatted to .156 in. Length to customer's requirements. Special shafts available

Dials: Standard or special dials, pointers, and chrome bezels available

Terminals: Screw type, AMP or Arkles

THE Wilcolator COMPANY

MANUFACTURERS OF LIQUID EXPANSION ELECTRIC THERMOSTATS FOR:

ELECTRIC RANGES • ROOM COOLERS • AIR CONDITIONERS • CLOTHES DRYERS • SPACE HEATERS • ROLL WARMERS • ROASTERS • FRYERS • STEAM TABLES • WARMING OVENS • RANGETTE OVENS • WATER HEATERS • BAKE OVENS, ETC. • STOCK WATER HEATERS • RESTAURANT APPLIANCES • VENDING EQUIPMENT • PACKAGING MACHINERY • PHOTO DRYERS • BLUEPRINT MACHINERY, ETC.

ALL WILCOLATOR THERMOSTATS ARE UL AND CSA APPROVED AND LISTED

# COMING YOUR WAY! THE FIRST REALLY NEW SALES-BUILDING PROGRAM IN HEATING AND AIR CONDITIONING IN 30 YEARS

CONTACT YOUR NEAREST GENERAL ELECTRIC HEATING AND AIR CONDITIONING DISTRIBUTOR FOR COMPLETE DETAILS OR MAIL COUPON TODAY. ——→

**GENERAL ELECTRIC**

AIR CONDITIONING DEPARTMENT • TYLER, TEXAS

GENERAL ELECTRIC CO. ACN-102
Air Conditioning Dept., Tyler, Texas

Attn. Mr. J. J. Heffernan:
I would like complete details on G.E.'s LIVE IN AN AIR OF SATISFACTION program for 1960. I specialize in . . .

☐ Home Heating and Cooling ☐ Commercial and Industrial Air Conditioning ☐ Both

Name_____

Firm_____

Address_____

City_____

County_____ State_____

# ARI Head Asks Field Help on Tax Fight, Certifications, Discusses Warranty

*By Rudy Berg, President,*
*Air-Conditioning & Refrigeration Institute**

Since the ARI is the sponsor of the 11th Exposition of the Industry, it was felt that publication in this "Show Issue" of the NEWS of excerpts from the talk by Rudy Berg, vice president, Copeland Refrigeration Corp., and president of ARI, before the recent annual RACCA convention, would be appropriate.

Theme of the session which he addressed was "Assured Profits Through Good Management." However, the ARI president concentrated his attention on some general industry problems—Federal and state taxes on equipment, warranties, questionable capacity ratings—which presently confront the industry and often result in reduced profits. He offers some thoughts on what the dealer-contractor can do about these and similar problems.

Speaking for our own company, we have found that mere "membership" in an association is fine, but that active participation in its affairs is essential to assure a strong industry—and industry which is able to present a solid front when confronted with problems both internal and external—and in the realm of external threats and problems I give high priority to unrealistic and outdated taxes of all sorts, restrictive regulations at all levels, and similar attempts by government which could legislate us out of business.

It is not my intent to deny the need for taxes, but I do want to lend emphasis to the need for better use of the tax power—better thinking on it—and the considerable need for greater leadership than we have been getting from our Congress, and Administration, and the Federal or local governments. We are probably going to have more taxes because our operation of government is going to cost more, but certainly we cannot let political expediency or lackadaisical attitudes permit the slowup of business expansion—or as, for example, in the air conditioning field, restrict an industry that has many natural limitations besides being a so-called "new" industry—the short selling season—the inventories carried over when we have a cool summer—etc. It is recognized that taxes depress and restrict development.

You all know about the 10% Federal excise tax on self-contained air conditioners. This was enacted as a "war measure" to help finance World War II, and was, supposedly, a temporary thing—but we still have it.

ARI's tax committee has arranged for appearance before committees of Congress in an effort to have this inequitable and outdated tax removed, but it is still with us. We have conferred with Internal Revenue Officials on a recent re-draft of the regulation under which it is administered, but to date the re-draft is more confusing than the original regulation. However, we are working with them in an effort to get an informal decision, if possible, as to what sorts of air conditioners the tax applies to; it may have to go to a hearing, but we hope not.

We know that the tax covers all room air conditioners, but just where it stops—whether it includes some unitary equipment—is a little nebulous. Of course, as long as the tax law is on the books, IRS must administer it, and our efforts must be directed at assisting them to provide administration that is as fair and equitable, and as nearly in line with the intent of Congress, as possible.

*Excerpts from an address at the annual convention of the Refrigeration & Air Conditioning Contractors Assn.

### Asks For Action on Repeal of Tax

But the big thing we all want, of course, is repeal of the tax, which singles out our industry for a 10% penalty. And here is where you—individually and as a strong association—can throw your weight with ours, in this effort. If each of you will write, or better yet, call on your Congressmen and Senators, telling them that the tax is inequitable, that it is a penalty on an industry which has done and is doing much for the health, productivity, and defense of our nation, and that you feel it should be repealed as a levy which has long since outlived its original purpose, you will be helping to create a favorable atmosphere for repeal of an adjustment in rate or coverage at the next session of Congress. I hope that other associations in the industry will join with us in this effort, for it is for the benefit of the entire industry.

### Fear States May See 'Cooling' Tax Revenue

Another tax problem—it may affect only a few of you right now, but if it spreads to other states it will come to affect more and more. Texas has recently enacted a tax of 3% on retail cost of air conditioning. This was a broad term and our tax committee went to Texas and worked with them to find out just what was to be covered. We wanted to know how the tax would be applied to a central system — whether the price would include the ductwork, the walls of the house, etc., and how it would be assessed.

As a result of the ARI tax committee meeting with Texas officials a decision was just received from the assistant attorney general advising that the Texas tax is limited to self-contained air conditioners. Now, of course, that too, is going to cover a broad range of sizes and types and becomes even more complicated when one considers the air conditioning system in a large building or in an industrial plant.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However, far more important than the interpretations of this specific state tax is the fact that there is a tax, and that, one state having started taxing air conditioning equipment, it may spread to other tax-hungry state legislatures.

Now as to some of the internal—within the industry—benefits of trade association participation, we have found—and I'm sure that you have, too, or, again, you wouldn't be here—that if one wants to have a strong association, and it follows, a strong industry, internal strife must be minimized.

The way to halt, or at least reduce to the lowest practicable point, the griping and beefing at association policies, criticizing activities of the association staff, and so on, one must take part in the formulation of these policies for the guidance of the association; one must take part in order to bring about the things in which he believes.

### Certification Program Road to Quality Product

Next, I would say that the profits through good business management would depend to a large extent upon the quality of the products handled. This follows, naturally, the "moral" aspect I have covered in what may be termed "point one." But a company may have the highest ethics in the world, so far as its own installations and other activities and commitments may be involved, and still try to cut corners by installing less-than-the-best equipment.

In this connection I cannot refrain from referring to the certification programs now in effect and proposed by the Air-Conditioning & Refrigeration Institute. The one program now in effect (unless they have done something on the several that were pending when I talked with them last week), covers unitary air conditioners—the types used in central air conditioning of homes and in some commercial and industrial installations. All of you know what the term "unitary" air conditioners covers, so there is little point in my attempting to describe it here in detail.

This program provides for testing and rating under ARI Standards; it provides for cross-testing by competitors, and for random testing by an independent testing laboratory under contract with ARI, and it provides for testing upon complaint against a given unit. If "certified" units fail to comply with ratings provided to ARI by their makers for listing in the "Directory of Certified Air Conditioners" the manufacturers may lose the right to place the ARI seal of certification on their equipment.

### How Certification Plan Is Policed

This seal of certification, you see, is in actuality a seal of certified performance. This is not a "voluntary" program in which companies may participate or disregard as they wish. The enforceable contracts agreeing to test and rate their equipment according to the applicable ARI standards have been signed by the companies participating in this program.

This is an example of what I mean by "quality products." Not all of the 50 manufacturers now participating in this program are members of ARI—this is not a prerequisite to rating under the program—but their products must conform to the ARI Standards.

Probably the most important factor in assuring a profit through good management is costing and pricing. None of us ever made a dime through unrealistic pricing, which is, naturally, a derivative of the too-prevalent trend to "meet competition."

The only way to meet such competition is to price your equipment to include a fair profit for your own organization. To do this, and to meet your competition without destroying your own business, involves improvement of your own in-the-family efficiencies of operation.

The five-year warranty has been very much in the spotlight. I think that most of you feel that it isn't good management on the part of your suppliers to continue this practice—and that it isn't good management for you, but there's nothing you can do about it.

### Individual Producers Must Act on Warranty

Well, maybe there is something you can do about it.

I believe that most manufacturers would like to get rid of this albatross around their necks, but they can't get together and agree to do it—that would be illegal.

Well, you will say, what can I do about it?

You men here in this room, and thousands like you all over the country who sell and install air conditioning and refrigeration equipment for the ultimate consumer, are the most important people in the world to every manufacturer of this equipment. You are his customers, and because of this he can be guided by what you want and need—he wants to keep you as his customers and he wants you to make a profit.

### Urges Letters from Field On Warranty Problem

If you feel that the five-year warranty is wrong, write to the sales manager of your supplying company and tell him you want it changed.

With enough concrete evidence from all of you, and your counterparts throughout the country, he can be guided into making the decision—and since you contractors, as a group, do business with virtually all of the manufacturers, your united pressure may be able to bring about what the manufacturers cannot do at their own level.

There is one way in which all of us as individuals can contribute to the growth of the industry. This is it:

How many of you here have air conditioning in your own homes?

Now, how many have air conditioning in your personal automobiles?

There are many of us in the same boat—we are trying to sell air conditioning to other people and we haven't sold it to ourselves.

If everyone in the industry—manufacturers, distributors, dealers, contractors, and service people — had air conditioned homes, think how many more people would be exposed to it.

Your friends who come in for an evening of bridge or poker on a sweltering night would feel the benefits; your neighbors would see and feel the benefits; even the delivery people from the stores, from the dry cleaners, would have exposure to happy, air conditioned homes.

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Anyway, it's *your* decision to make . . . if you enter the big new contest sponsored by UCON Brand Refrigerants. The moosehead is the first prize. There are 65 (count 'em) 65 other jim dandy awards . . .

*5 Second Prizes:* A HEADLESS BEARSKIN RUG (or a $100.00 U.S. Savings Bond)

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STAKE YOUR CLAIM NOW . . . HERE'S HOW! First, run like mad down to your nearest UCON Refrigerant wholesaler. When you've caught your breath, look for UCON IKE's picture on the special contest display, and whip out an entry blank. Complete the statement on the blank (in eleven words more or less), print your name and address (and the wholesaler's) on the blank . . . drop your entry in the box.

THE WINNING NAMES will be announced shortly after the contest's conclusion. If you're a winner, both you *and* your wholesaler will receive *duplicate* prizes. And even if you don't win one of the frabjous top prizes, you'll get a FREE UCON Refrigerants Tie Clip—the coolest thing that ever happened to a cravat. We mean, like, *nobody* loses!

CONTEST RULES
(The lawyer says we have to have them)
This contest is open to all air conditioning and refrigeration contractors, dealers and servicemen during the contest period: November 2, 1959 through January 30, 1960. Employees of Union Carbide Chemicals Company, Ansul Chemical Company, their subsidiaries and agencies are not eligible to enter the contest. UCON Refrigerant wholesalers are also ineligible—*but will be awarded duplicate prizes if their names appear on prize-winning entries.* Winners will be announced by mail within a few weeks following the contest.

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# Consulting Engineers to Contractors: We Save You Money, We Like Bid Separation, Selected Bidders List

LOS ANGELES — The consulting engineer can make the job more profitable to all concerned, including the air conditioning and refrigeration contractor, because when he designs a job the cost of design engineering is eliminated from the contractor's operating cost, and bidding is done on the same set of data.

That was a principal point made by Ralph M. Westcott, Holladay & Westcott, Los Angeles, and president of the Consulting Engineers Council, in a talk before the recent annual convention of the Refrigeration & Air Conditioning Contractors Association here.

Westcott endorsed the principle of bid separation and prequalification of bidders and the establishment of a selected bidders list for each project. He described, in some detail, what the consulting engineer considers to be his function in the field of air conditioning and refrigeration, and explained how this could be of benefit to all elements involved in a job.

### Must Be Free From Commercial Ties

"As consulting engineers we are committed to render independent judgment and utilize our technical competence and experience in the best interests of our clients," Westcott stated. "This philosophy precludes our having commercial affiliations or alliances whereby we might profit through the use of these affiliations.

"It makes little difference whether the service or product was the best or most suitable for a specific application, if we made a profit for its use we would still be suspect. At all times our primary obligation is to serve our clients to the best of our ability and in their best interest. For these services we receive a fee and for this fee we are expected to have full understanding of all of the objectives that the project demands.

"We believe that consulting engineers can obtain this information more completely and objectively than can either manufacturers or contractors who attempt to be all things to all people.

### View of Mfr., Contractor, Engineer's Functions

"It seems to us that manufacturers have a full-time job in developing materials and equipment of high quality and performance without entering into the application field of their equipment. It would also seem that contractors have a full-time, challenging job of the assembly of materials and equipment into functioning systems that operate satisfactorily. Consulting engineers should evaluate every reasonable means of accomplishing the objective established by the client or owner.

"This does not mean that he takes the first thing that comes to mind and designs according to that concept. He should evaluate all reasonable possible solutions to the problem and develop cost comparisons for initial construction, as well as maintenance and operating costs. From these calculations and in consultation with the owner a decision is made as to the most suitable system to be designed.

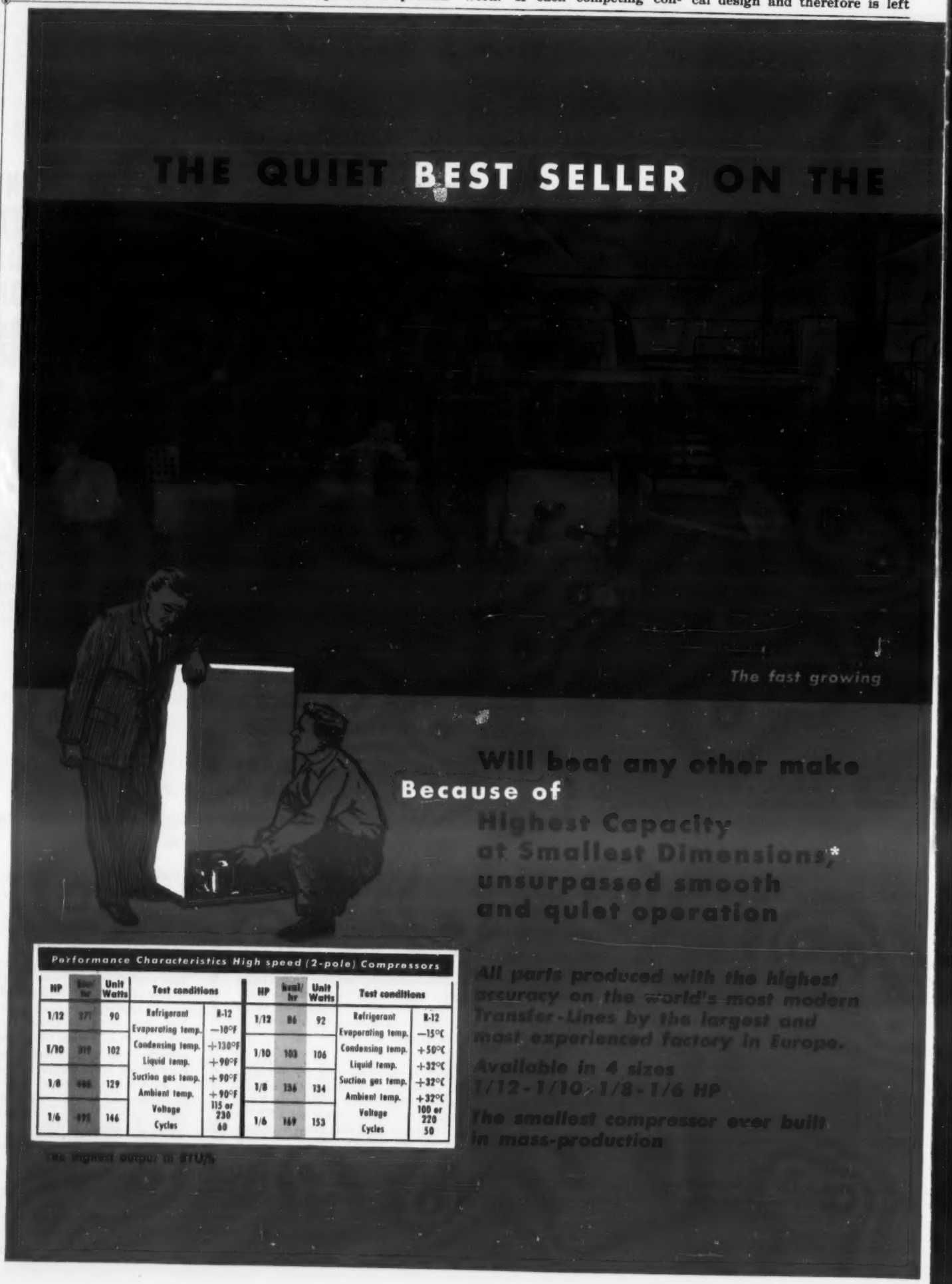
"Since he has no basic interest from a commercial alliance standpoint as to whether the system will be a compressor system, a centrifugal or possibly absorption, his evaluation will be impartial and objective.

"It goes without saying that the manufacturer or contractor who has a different system to offer than the one which was designed, may be unhappy or even highly critical of his design, but at least there will probably be one happy manufacturer and one happy contractor because they will be the ones best suited to fulfill the plans and specifications as prepared by the engineer. The final work of the engineer is the preparation of graphic guides in the form of plans and specifications so that construction can be accomplished.

### Bidding Should Be All On One Set of Plans

"It is my understanding that the construction industry favors the competitive bidding procedure. In order for competitive bidding to accomplish its purpose it is essential that the competitors bid on the same work. If each competing contractor is required to do a design job in order to enter a bid for the project, this may involve a substantial amount of engineering or selling cost, which he must recover by one means or another. It is not likely that two contractors will come up with the same solution and as a result their prices are not comparable.

"The owner is then in the position of having to evaluate these proposals both from a dollar standpoint and a technical one. In general, he is not qualified to evaluate the technical design and therefore is left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Evaporating temp. | —10°F | Evaporating temp. | —15°C
1/10 | 102 | Condensing temp. | +130°F | 1/10 | 106 | Condensing temp. | +50°C
Liquid temp. | +90°F | Liquid temp. | +32°C
1/8 | 129 | Suction gas temp. | +90°F | 1/8 | 134 | Suction gas temp. | +32°C
Ambient temp. | +90°F | Ambient temp. | +32°C
1/6 | 146 | Voltage | 115 or 230 | 1/6 | 153 | Voltage | 100 or 220
Cycles | 60 | Cycles | 50

at the mercy of the dollars.

"If he uses dollars as his sole criteria, he may in rare cases get a very ingenuous and competent job, but more than likely he will get one that will be inadequate in many ways, at least according to the mental standards which he has developed in his own mind, but which were never conveyed completely to the contractors who are competing for his work.

"No matter which competing contractor gets the final award the others will have lost the engineering time required of them to prepare their proposal. This lost engineering time must be covered by an increased price on the jobs where he is chosen as the contractor.

### How Consultant's Work Can Reduce Costs

"When a consulting engineer designs a project he is paid for it by the client and he is responsible for that design. The cost of design engineering is eliminated from the operating cost of the contractors, and each competing contractor is presumably bidding on the same set of data.

"Assuming equal competence between the contractors, the contract can then be awarded on a competitive price basis with a reasonable assurance that the owner will be receiving the equipment and system similar to that which was offered by each of the other contractors.

"I believe in the principle of bid separation and pre-qualification of bidders and the establishment of a selected bidders list for each project. If bid shopping is abhorrent to the sub-contractors, it is equally so to the consulting engineers. It certainly creates problems that we would like to have eliminated.

"Plans and specifications prepared by the consulting engineer should be complete. There should be a minimum of changes necessary during construction and there should be a minimum of doubt in the minds of the contractors as to what is expected of them and how the project is to be constructed.

### How Contractor Can Aid Consultant

"We need your help in telling us what you require in our plans and specifications in the way of details and descriptions, so that your job can be made easier and, we hope, more profitable. We need your help with constructive criticisms when you feel that you have a better method to offer on construction techniques or the use of equipment and components. The consulting engineer should listen with an open mind to these comments and criticisms, but it should also be understood that they cannot always be accepted because there may be underlying reasons which dictated the original selection.

### Contractor Actions That Get 'Black Mark'

"We do not appreciate the occasional contractor who makes a practice of looking for the inevitable small loopholes in the plans and specifications, so that he may impose excessive charges for the necessary change-orders. Nor do we appreciate the contractor who makes a practice of always criticizing the engineer's design and claiming that under all circumstances he could do it better and cheaper.

"You are interested in more profitable business, so are we. How can we work together for this common objective? First we must have a tolerant understanding of the other fellow's problems and realize that no matter how hard we try none of us are perfect.

### Consultants' Problems

"At this point I would like to explain a few of our problems which may not always be recognized or understood.

"1. All of our services are based on personal endeavor. In other words, solely on labor. The final product of our efforts is a set of plans and specifications which has a very small, intrinsic material value. In fact, more often than not, cost of reproductions is covered in our fees or absorbed in general overhead.

"2. We have no products on which we can obtain a mark-up profit to accompany these manpower time sales which would help to cover our overhead and other costs.

"3. The services we are to render are largely indeterminate at the outset of a design project. However, when we are through we are expected to furnish a completely detailed and competent set of plans and specifications exactly expressing the owner's wishes and fully outlining what is expected of the contractor.

"4. We seldom have the opportunity to reuse previous work since no two projects are sufficiently alike, therefore there is little opportunity to establish production line techniques.

"5. We are responsible for establishing budgets and cost estimates.

"6. And last but not least, we are responsible for calculations, equipment selection and system design, and final operating performance.

"I believe engineers should accept these responsibilities and be held accountable for their successful performance. I certainly do not believe that there should be a feeling of competition between contractors, manufacturers, and consulting engineers, but one of fundamental cooperation. Through this cooperation we can approach the ideal business climate while at the same time providing the best environmental climate for our clients and customers."

## 'Good Neighbor' Condenser Uses Its Head

VERTICAL DISCHARGE of air is "Good Neighbor" feature designed into new remote condensers for Perfection Industries' residential and commercial air conditioners and heat pumps. C. W. Millsom, vice president-sales (l.), and Richard A. Burket, chief air conditioning engineer, demonstrate how noise as well as air is carried upward.

## *Would They Name It 'Cool-nal St.'?*

NEW ORLEANS—The engineering firm of deLaureal & Moses, Inc., has presented to the Retail Merchants Bureau of the Chamber of Commerce of the New Orleans Area a plan for a Canal St. elevated expressway and air conditioned sidewalks at present grade level.

Along each side of a central retail space would be a glass-enclosed, air conditioned sidewalk which would extend as enclosed from one side street to the next.

In good weather pedestrians would be free to use either the air conditioned walk or the sidewalk and could cross intersecting streets readily as traffic would be under control of a simple stop light, according to the proposed plan.

## Vornado, Inc. To Set Up Headquarters In Garfield, Rebuild Organization

GARFIELD, N. J.—Plans for Vornado, Inc., the new corporation which would result from the proposed merger of O. A. Sutton Corp., Inc., and Two Guys From Harrison, Inc., reportedly moving the Wichita, Kan. headquarters to Garfield.

Garfield is the headquarters location of Two Guys, a discount store chain. The firm operates 14 retail stores in New Jersey, Pennsylvania, and Maryland.

Herbert Hubschman, president of Two Guys and scheduled to become president of Vornado, said a 250,000-sq. ft. building will be constructed adjoining the present 600,000-sq. ft. headquarters of Two Guys to house the new company's production and distribution facilities. The addition is expected to be completed next year.

The new firm plans to merchandise on a nationwide basis. Executive, sales, and clerical workers for Vornado headquarters are now being sought, it was indicated.

The 1960 Vornado product line will include air conditioners, humidifiers, heaters, and fans, it was understood. As reported in the Oct. 19 issue of the NEWS, the new corporation's manufacturing division would offer its products to other retailers.

Directors of Vornado will be Hubschman; O. A. Sutton; and Sydney Hubschman, Jacob Stolbach, and Frederick Zisu, respectively vice president, controller, and counsel for Two Guys.

Herbert Hubschman compared the Vornado setup to the Sears-Whirlpool relationship which, he believes, stabilized that line and did not interfere with other dealers carrying the same products.

Shareholders of Two Guys will vote Nov. 3 on the merger agreement and Sutton stockholders will vote the following day.

## D-H To Air Condition Hollywood Landmark

LOS ANGELES—A contract to air condition the California Bank building, famed six-story Beverly Hills landmark owned by the Estate of Louis B. Mayer, has been awarded to J. Herman & Co., air conditioning contractor here.

The 27-year-old structure—tenanted by many film notables, talent agencies, lawyers to the motion-picture industry, and independent film production offices—will be year-round air conditioned by means of a Drayer-Hanson chilled-water fan-coil system using reciprocating compressors.

The firm's console-type air conditioners will be room-by-room floor-mounted through the building with halls being serviced by heavier roof-mounted H-series air conditioning equipment. Activated charcoal carbon filters will be used to eliminate smog.

A total of 100 tons of air conditioning will be used in the 150-room structure, according to Drayer-Hanson Sales Manager Irvin Secord.

Setting the deal with Harry Wolfe of J. Herman & Co. was Drayer's local-area sales agent group, Air Conditioning Supply Co.; Gordon Paxon, sales engineer.

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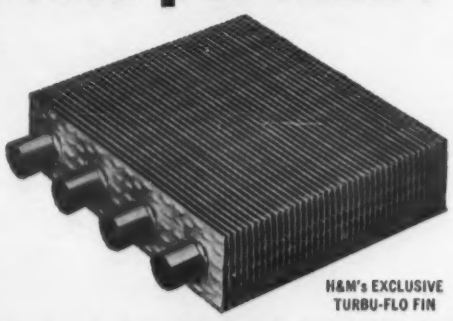
When perfect performance depends on correct design, specify H&M coils. Ask your wholesaler for complete information or write to Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.



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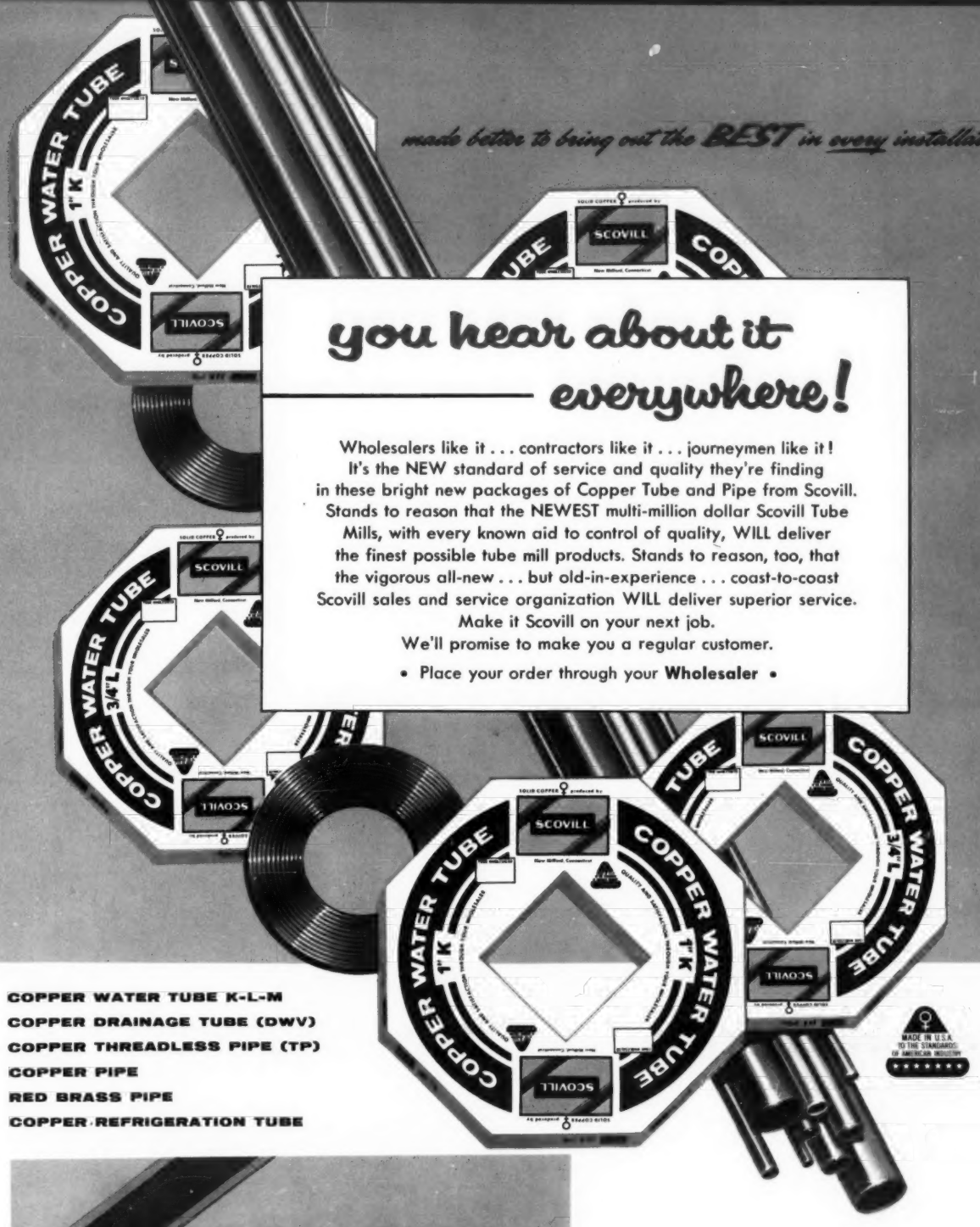


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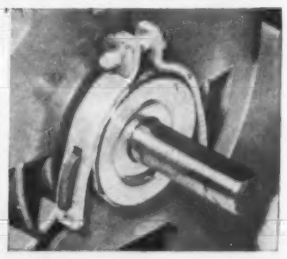
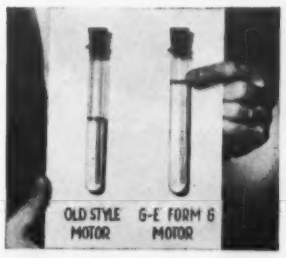
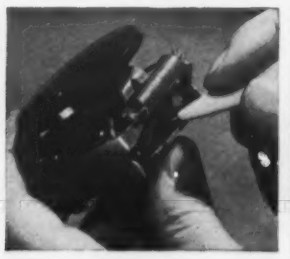


**NEW! PROTECTIVE FINISH.** Special shaft treatment minimizes corrosion, thus simplifying removal of fans, pulleys and couplings.




**LONG LUBRICATION LIFE.** Large oil supply and superb retention system cut maintenance—eliminates reoiling in many cases.



**NEW! QUIET, SURE SWITCH.** Special washer cushions switch click, maintains positive snap action under heaviest demands.

**LONG-LIFE STATOR**—Mylar* polyester film, Formex† wire, heavy-duty bonding dip resists heat, moisture, and electrical stresses.

*Registered Trademark of duPont Co.
†Registered Trademark of General Electric Co.

General Electric's motor story can be summed up as *service plus.* For instance:

**GENERAL ELECTRIC ENGINEERS** will help you tailor a Form G motor to meet your performance requirements and provide the fast sample service you need to finalize the design and tooling of new models.

**APPLICATION HELP** from G-E engineers—specialists in air-conditioning motors—assures you of the best motor for your product, commensurate with your specific performance requirements.

**MANUFACTURING CAPACITY** and multi-plant flexibility are geared for fast deliveries of volume orders. This assures you of constant availability of the motors you need.

**AND THE RIGHT MOTOR IS AVAILABLE** from General Electric *now.* You'll find the motor you need in General Electric's complete line of years-ahead fhp motors designed specifically for your air-conditioning requirements. If you'd like help on a specific problem, contact your nearby General Electric Apparatus Sales Office. For more information on Form G motors, write for bulletins GEA-6424 and GEA-6533, to General Electric Company, Section 702-106, Schenectady 5, N. Y.

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**GENERAL ELECTRIC**

# Conversion of Cooling Units to Heat Pumps Still an Important Issue

STATE OF FLORIDA — Depending on who you talk to here, the role of converters in the heat pump industry is due to increase or fade to nothing.

"Even though I have converted over 5,000 units of all sizes, I feel strongly that conversion is not the answer if the heat pump is to be universally applied and sold," offers Les Grant, general service manager of Hill York and associated companies, Miami. One of the largest and most experienced converters in Florida, Grant feels that good conversion technique is not followed by most shops.

"At its best, though, conversion cannot approach the results to be expected from a fully designed heat pump," Grant insists, "if we consider more than just warm climate areas."

Hill York neither makes nor loses money on conversion work, Grant states. Their work is done for dealers.

### New Shop To Handle 300 Conversions Weekly

In nearby Hiahleah, Frank Trevett of Gables Cooling & Heating, Inc., is rearranging his new shop to handle 300 conversions a week. "Conversions, properly accomplished, can provide good quality heat pumps for the southern market," Trevett holds. "For those manufacturers who don't want to interrupt mass production of cooling units for a few hundred heat pumps, it is cheaper to ship the cooling units to this area and pay for conversion."

One manufacturer who both builds heat pumps and authorizes conversions, agrees that the economics of mass production frequently make conversion more profitable for the manufacturer. "Too, it adds flexibility to our merchandising," he continues. "We can send down a bunch of cooling units without having to anticipate or predict how many should be heat pumps, how many straight cooling units."

Other manufacturers who authorize conversion of their cooling equipment point out that bootleg operators would convert their units, authorized or not. "By authorizing converters and regulating their techniques, we can assure ourselves of reliable and optimum performance."

### 'Tapping on a Reversing Valve Doesn't Make a Heat Pump'

Speak of quality in conversion work, and fire shines in the eyes of James "Hans" White, St. Petersburg. Hans is considered by many producers and component suppliers to be the outstanding authority on conversion. White's Sealed Units, Inc. has at one time or another done conversion work for 23 heat pump producers.

"Tapping a reversing valve on a cooling unit is not conversion," fumes Hans. "This technique results in a unit whose heating capacity balances cooling capacity only down to approximately 42°.

"At 32° a properly converted unit will have about the same heating capacity as it has cooling capacity; if it doesn't have, it is not a heat pump, but a reverse cycle air conditioner."

Presently converting a couple manufacturer's units on a production line basis, White also has in his plant equipment from leading manufacturers for redesign or for incorporation of some of his own ideas. The altered units are then sent back to the originating factory for evaluation.

"I have taken as long as a year and a half on a conversion," boasts Hans. "I start from scratch, recircuiting the coils, building in correct piping and valving, making electrical alterations."

At times, after Hans has created a heat pump from what was formerly a cooling unit, the company will begin production of the unit, and Hans has no more to do with it.

A few manufacturers, who are not completely convinced that the heat pump has a great future, use converters because they are reluctant to devote the energies of their engineering staffs to the project.

Conversion of a 1 or 2-ton window unit can be accomplished in from 2 to 4 hours. Approximately one third of the time is devoted to tapping the lines and installing the reversing valves; the remaining time is spent on electrical work—installing heating-cooling thermo-

## History of 'Converters'

Although manufacturers were experimenting with heat pumps during the early '30's, extensive heat pump development really got started with the activity of Florida "converters" seven to ten years ago. Using some of the earliest reversing valves—and, in a few instances, two red and two green manual valves—individual shops converted air conditioners into heat pumps. Limited almost exclusively to room units, these first conversion activities were able to handle the heating needs of southern Florida. (29-year average: 173 degree days.)

Today, some manufacturers authorize limited conversion of their equipment for the southern market even though they produce heat pumps on their own assembly lines.

In addition, there are "bootleg converters"—unauthorized converters who will install a changeover valve for individual customers or for dealers of units whose manufacturers do not permit conversion.


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"Hi-Fi" filter block desiccant . . . super-fine monel screen filter tube and inlet distributor disc help give Drymaster superb filtering and drying properties. Drymasters are available in six different models with 36 different end connection sizes in flare and solder types. Copper extensions allow the use of either hard or soft solder . . .

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VAMPCO ALUMINUM PRODUCTS, LTD., STRATHROY, ONTARIO

stats, beefing up relays, defrost controls.

Conversion is not limited to small units. White has units up to 7½ tons. Hill York converts 25-ton water-to-air jobs, taking six man-days to complete the multicircuited conversion.

Charles Wiederhold at Thermo-Aire Service Co., Hiahleah, handles larger package units, water and air source. Wiederhold reports that his conversions have gone from 75% water source to 75% air source in little over a year. "On water-source conversions, we seal all controls so they cannot be tampered with in the field," he says.

Discussing the adverse affects of poor conversions, Hans White commented:

"A conversion which consists of installation of a reversing valve only leads either to compressor burnout or seizing. Since there is improper refrigerant control, the unit will be overloaded at high ambients; at low ambients, the unit will flood the compressor, washing out the lubrication."

"Without a heating-cooling thermostat, the unit will be repeatedly overloaded at high ambients, causing a burnout."

During 1957-58, southern Florida experienced a "cold" winter (435 degree days!) and thousands of complaints were received that heat pumps were not delivering heat although they were running. Until that time, almost no one in southern Florida would have recommended putting defrost controls on converted units for that area. But during that winter, the temperature dropped to the low 40s and high 30s—ideal temperatures for building frost on the outside coil.

While there are still holdouts, many shops are now installing defrost controls as part of the conversion.

## *Hampton, Va. School Air Conditioned with Packaged Heat Pumps*

HAMPTON, Va. — The John B. Cary elementary school here claims to be the first to be air conditioned and heated by packaged heat pumps.

Thirty-six General Electric Weathertrons spotted under classroom windows take up practically no floor space in the 38,951-sq. ft. school. They cost $6,000 less than the next lowest bid, which provided for heating only.

Virginia and Electric Power Co. pointed out that Virginia law requires circulation of approximately 13 c.f.m. of fresh air per person. With conventional heating this meant exhausting that quantity of 72° F. air to the outdoors every minute of the school day.

*In Disaster Shelters*

## Buffalo Forge Steps Up Effort In Field Of Protection from Radioactive Fallout

BUFFALO — Buffalo Forge Co. is stepping up its activities in the field of protection from radioactive fallout in disaster shelters in the event of nuclear, biological, or chemical warfare.

In quick succession the company disclosed that it:

1. Will participate in a study which will seek to determine what a new upstate community can do to protect itself from the effects of nuclear and other modern warfare techniques.

2. Has increased sales of its specially designed ventilators for large as well as family-type bomb shelters.

The study in which Buffalo Forge will cooperate will be undertaken this fall and winter at Cornell university.

It will seek to determine the feasibility of building underground an International Business Machines Corp. computer plant employing 1,500 workers, as well as planning for the protection of a supporting community of 9,000 persons.

Buffalo Forge's role in this project will be to supply technical information on standards for the ventilation, air conditioning, and air filtering for the underground plant.

The study will explore various measures which a critical industry might make to insure the survival of employes and continued operation of the plant in the event of an attack by an enemy using nuclear, biological, or chemical warfare weapons.

Placing an industry underground, either by boring into the side of a mountain or scooping out a large hole and covering it with soil, is one of the defensive measures which will be considered.

The study team, which will include some 30 graduate students, will investigate a number of sites in Upstate New York for the theoretical IBM plant.

Others cooperating with Cornell in the study are the New York State Civil Defense Commission, the United States Office of Civil & Defense Mobilization, the American Machine & Foundry Co., and IBM.

Sales Manager Charles W. Lockhart of Buffalo Forge's Blower & Air Conditioning Div. said the company has received a surprising number of inquiries recently on its two types of hand-operated ventilators for large and family-type bomb shelters.

Sales of the family variety particularly have risen, although the number still is not large, Lockhart remarked.

He attributed the interest in the bomb-shelter ventilators principally to two factors: Gov. Rockefeller's proposal earlier this year for compulsory family bomb shelters, and a study of the whole problem by the Army's Corps of Engineers.

Since such bomb shelters probably would be without electricity in the event of an attack, the devices come in hand-crank-operated models. The smaller family size is designed for use in shelters holding from five to ten persons, depending on their physical activity.

The family bomb-shelter ventilator, weighing only 32 lbs., even has a handle for ease in carrying.

Both units require suitable filters. The larger ventilator is designed to provide filtered air for 40 to 75 persons in a shelter.


# A.R.I. EXPOSITION IN ATLANTIC CITY AND EXCITEMENT, PRIZES AND LINE OF MUELLER BRASS CO.

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Tells at a glance the condition of refrigerant. Available in sizes from ¼" through ⅝" interchangeable male flare, female flare and solder end connections. This makes possible 42 combinations ready for installation on any system.

**Safetymaster**
**pressure-relief valves**

Provide positive action and high volume discharge without chatter or vibration. Available in safety-sealed standard pressure settings from 150 to 450 lbs. in straight through and angle types. Meets A.S.A. B 9 safety code, certified by National Board.

**Globemaster**
**packed valves**

Carefully engineered and constructed of highest grade materials to give long trouble-free service on every installation. Made in straight-through, angle, two-way and three-way models either backseating or non-backseating types.

**Linemaster** valves

feature super-sealing with triple diaphragm construction. Linemaster Regular and Linemaster Special (Backseats to permit inspection of the diaphragms while valve is under pressure) are available in two-way, three-way, straight-through and angle, plus hand expansion and purge types in all popular end connections.

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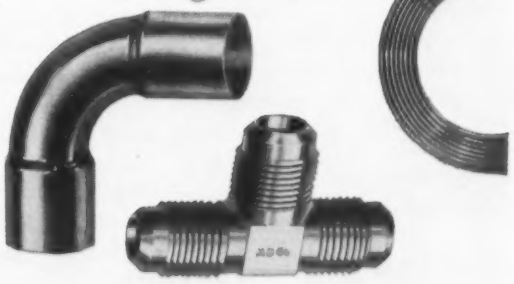
**copper tube and fittings**

Fine quality cleaned dehydrated and sealed copper tubing of uniform soft temper for easy bending and hard-drawn copper tube in straight lengths in a variety of sizes. A complete line of high quality solder-type fittings manufactured from seamless copper tubing and flare fittings from forged brass or brass rod.



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# Inside Dope

By GEORGE F. TAUBENECK

*(Continued from Page 1, Col. 1)*

How about auto air conditioning? It provides even fresher air!

### *Refrigeration Note*

Add New Uses:

Hamilton Watch Co. now freezes stocks of timepiece movements—to keep all parts, plus their lubricating oil—from deteriorating prior to encasement.

### *Add Newspaper Laughs*

Several years ago Jon Lindberg landed in a St. Louis hospital. His famous father flew to his bedside. Heralded the *St. Louis Star-Times:*

LINDBERG LANDS,
HURRIES TO JON

Another innocent, the *Charleston* (S. C.) *Evening Post*, reported the return of double-spy Otto John to West Germany—which didn't know what to do with or about him. Its headline:

GERMAN SOCIALISTS
WIN FIGHT
FOR SPECIAL SESSION
ON JOHN

The groom has been married previously on two occasions. He has also been through World War II. — *Wildwood-by-the-Sea* (N. J.) *Independent Record.*

An international beauty contest will continue under another name—without bathing suits.—*New York Herald Tribune.*

Rosensohn, in talking to reporters, emphasized that the Johansson-Patterson fight had not even been fixed.—*Albuquerque* (N. M.) *Journal.*

The bridal bouquet was of pink sweetheart roses with the Aluminum Company of America. — *Davenport Morning Democrat.*

Man Goes Up Tree With Bear Behind.—*Baltimore Sun.*

### *Diplomatic Salesman*

From a recent issue of *Printers Ink*, a magazine for the advertising and marketing fraternity, we quote the following without comment:

"A lady copywriter who is unusually tall and thin, and has trouble buying clothes, tells us that last week she tried on seven pairs of shoes in a famous New York store.

"Not one of the styles looked right on her long foot. Finally, the patient salesman found a pair that was perfect but, like most things that are, it cost too much.

"You have a very expensive foot," urged the anxious salesman.

"And I have a very expensive body," automatically responded the copywriter, thinking of the difficulty she suffers getting anything to wear.

"Madame," said the horrified salesman, "I certainly wasn't snooping about your profession."

### *Amen, Brother Neubauer!*

E. T. Neubauer, Copeland's chief engineer, has written a remarkable letter to the President of the United States.

We share it with you:

Dwight D. Eisenhower,
President
United States of America
White House
Washington, D. C.

Dear Mr. Eisenhower:

In the normal course of living the considerate and God fearing citizens want to see all people treated equitably and fairly. This is the basic concept of the Declaration of Independence, "All men are created equal."

When individuals seek special gain or unfair advantage without merit, they soon gain a reputation which does not command respect. This is as it should be:

Recently our Supreme Court rules that there shall be no discrimination in our schools as to race, creed, or color. Segregation has been ruled discriminatory even in the face of equal educational opportunity in segregated schools. The majority of the American people applaud this progress of our Nation.

However, our Federal Government seems to have a double standard in regard to individual liberty and equality.

When it comes to income (earned) by an individual, the taxation is such that it virtually puts the individual on an evil basis and fines him very heavily (up to 91% of his earned income).

If the individual is clever at investments and makes big gains without "earning" the income, he is "fined" only up to 25% of such income. Why should an individual who earns his income by meritorious business management be fined so heavily?

How can our Federal Government hold our state governments as acting unconstitutionally by having segregated schools of equal educational opportunity when the Federal Government itself, has such gross inequity in its taxation toward the individual?

In consideration of this, it may be good to refer to the words of the great Master of human relationships as they appear in the 7th Chapter of Mathew, verses 1 to 5 inclusive. Here such actions are labelled "hypocrisy." The last verse reads:

"Thou hypocrite, first cast out the beam out of thine own eye; and then shalt thou see clearly to cast out the mote out of thy brother's eye."

A careful study of the graduated income tax system reveals that it promotes the possibility of the men in Government being responsible to only a few, while they enjoy the privilege of the backing of the masses.

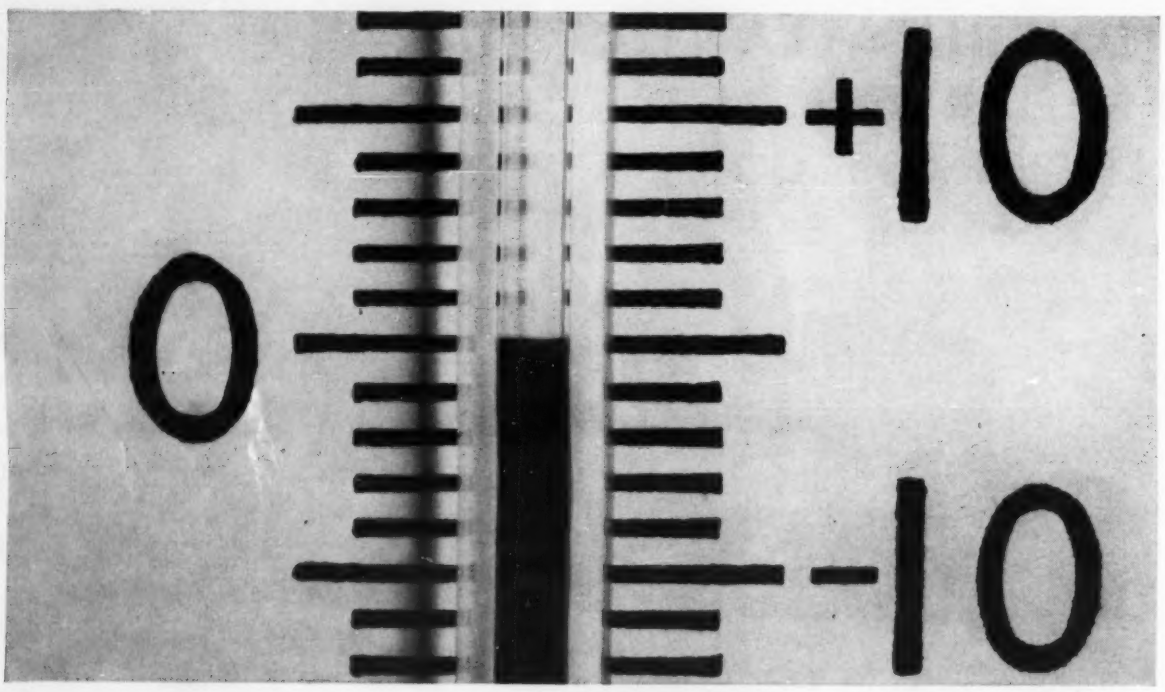
In the case of income tax, witness Representative Frank Thompson's Bill (H.R. 2440)—this is an illustration as to how ridiculous the entire situation can become when we try to apply discrimination in our taxation.

This history shows that we have reached dangerous ground and something must be done.

We do not think much of Russian Communistic methods, and we find ourselves in a cold war with her because of our differences.

Mr. President, how can we win a complete moral victory in this cold war, when we apply a Communistic principle "discriminatory taxations known as the graduated income tax?"

I have used strong language in criticizing the Federal graduated income tax. With such criticism belongs the responsibility of a constructive sugges-

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"Genetron" Super-Dry Refrigerants are available from refrigeration and air-conditioning wholesalers from coast to coast. See your wholesaler. Insist on "Genetron" in *all* your frozen food refrigeration equipment!

**Quick Facts on "Genetron" Super-Dry Refrigerants**

- Guaranteed exceptionally low moisture content
- Noncorrosive to standard equipment materials, nontoxic, nonflammable, stable, safe
- Critical and freezing points well outside range of operating uses
- Solvent action on oil helps prevent solidification or congealing of lubricant; aids in lubrication of equipment; generally miscible with oil
- Freely interchangeable and may be mixed in any proportions with comparable fluorinated hydrocarbons meeting the same strict refrigerant specifications

**genetron 11** ORANGE LABEL $CCl_3F$ TRICHLOROMONOFLUOROMETHANE
**genetron 12** WHITE LABEL $CCl_2F_2$ DICHLORODIFLUOROMETHANE
**genetron 22** GREEN LABEL $CHClF_2$ MONOCHLORODIFLUOROMETHANE
**genetron 113** PURPLE LABEL $C_2Cl_3F_3$ TRICHLOROTRIFLUOROETHANE
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tion. My suggestion is to have our income tax at one rate with no exemptions.

This would make each man responsible to the extent of his benefit in this great land.

The same rate should hold true for profits made from investments. This method of taxation would be eminently fair and in full accord to the Constitution of this great land of ours.

It would also be in accord with all states which now forbid a graduated income tax for their state.

This idea would also save a tremendous sum of money for the Government because all men on straight salary or wages would not and need not file a return.

Considering Social Security, the Federal Government seems to reverse the trend. Here only the lowest income is taxed. In order to make taxation completely equitable, I would suggest that Social Security tax be made one rate for all income.

Let us truly make this the land of the free by adopting an American system of taxation, which is in full conformity with the spirit of the Declaration of Independence and the Constitution of the U.S.A.

E. T. NEUBAUER

## WSL Sponsors Series Of Cleaning Clinics

NEW YORK CITY — Water Service Laboratories, Inc., chemical engineer and corrosion prevention specialist, has initiated a series of cleaning clinics for air conditioning contractors and others concerned with equipment maintenance to be held at times to be announced during the coming year.

The next session will take place this fall.

A panel of chemists and engineers from the WSL staff is available to answer questions at the conclusion of the discussion.

Attendance at the cleaning clinic meetings will be by invitation only. Inquiries can be made to Water Service Laboratories, Inc., 615 W. 131st St., New York 27, N. Y.

## Issues New Edition of Heat Transfer Guide

CHICAGO — Rempe Co., 364 N. Sacramento Blvd., Chicago 12, recently announced publication of the new 1959 edition of its engineering data book authored by A. G. Vogel, general manager.

The book consists of 48 pages with convenient references for the engineer, draftsman, or any one concerned with the design of heat transfer equipment, it was noted. A feature of this latest edition, the company said, is the inclusion of depressant factors for pipe coils and fin coils when operating at high altitude conditions such as encountered in altitude assimilation chambers.

A copy of the data book may be obtained by sending a request to Rempe "on your company letterhead."

## Klixon Open House Features Seminars For Servicemen

ATTLEBORO, Mass.—Forty-five motor, appliance, and refrigeration servicemen attended open house at Metals & Controls Div. of Texas Instruments, Inc. recently.

The Attleboro plant manufactures the "Klixon" line of motor-compressor controls. Those attending represented repair shops in New Hampshire, Massachusetts, Rhode Island, and Connecticut.

The open house included a tour through the motor protector production area.

Three seminar sessions were held. The first, led by Leo Kowal, service shop specialist at Metals & Controls, was on the construction of the Klixon motor protector, the effect of the component parts on the over-all operation of the device, and the way it protects against the various overload conditions in electric motors.

LEO KOWAL (standing), Metals & Controls' service shop specialist, shown at one of three seminars on Klixon motor-compressor controls. The seminars were held recently during an open house for motor, appliance, and refrigeration servicemen in the New England area at Metals & Controls' manufacturing plant, which is located in Attleboro, Mass.

Gale Swartwood, of the motor controls sales and engineering staff, talked on the procedure involved in applying Klixon protectors to motors and illustrated the extensive testing required.

The third session was devoted to a description of the Klixon protector coding system. New cross-reference data information and code identification sheets were distributed.

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# Minor Alterations In House Design Put Heat Pump In $13,000 Home

## *Unit Over Carport Area, Supply Duct In Crawl Space*

JACKSONVILLE, Fla. — A heat pump air conditioned home that sells for $13,275 is the talk of real estate circles in this area, and will be featured in an article in a forthcoming issue of *House and Home* magazine.

Fact is, these homes in the Pearce-Uible project in Jacksonville could be said to have been "built around" the Fedders "Adaptomatic" heat pump. G. M. Chady, mechanical engineer for Southernaire Distributors, Fedders outlet, and Lawrence Raley, head of the builder's architectural department, worked some six months on plans for a home which could be fully air conditioned and yet sell for less than $14,000.

Something had to be cut in the original design of the homes and an arrangement was agreed upon whereby the builder would discontinue plans for a screened-in porch area with a slide access door and substitute the "Adaptomatic" heat pump.

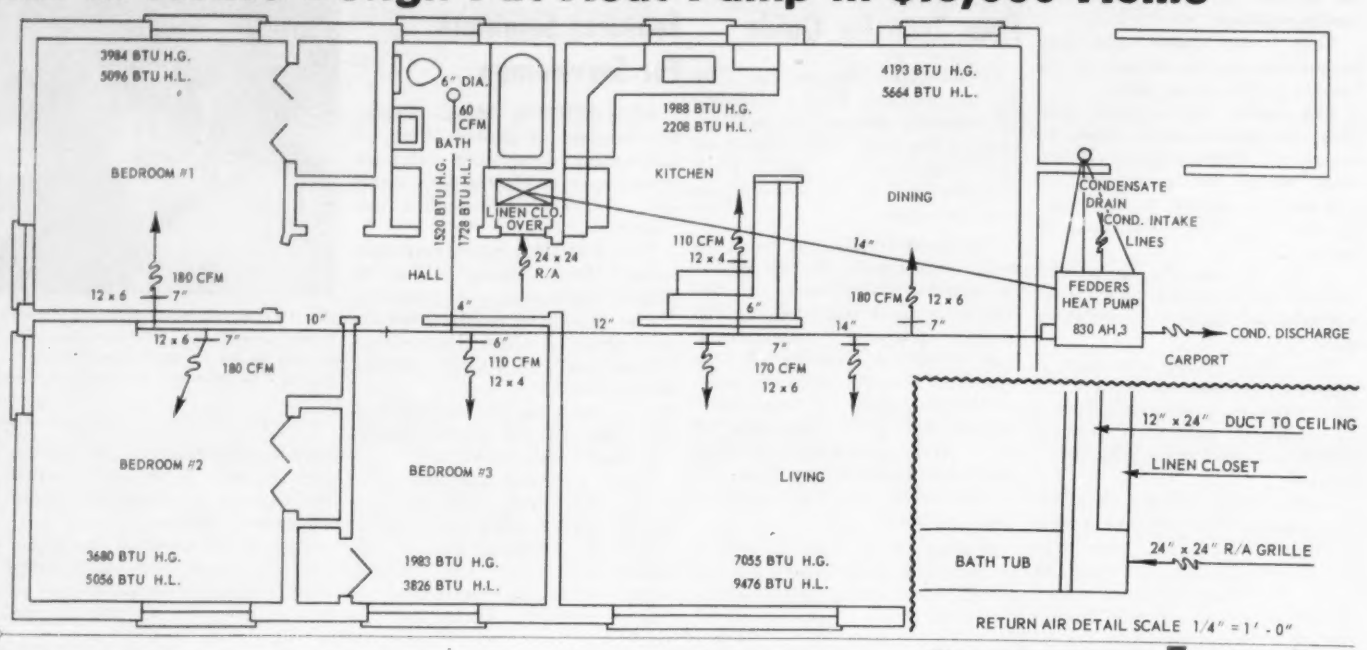
Certain problems in application had to be solved. Gravel roofs are being used in construction, and it is not possible to get too much of a pitch with them. Initial specifications called for an over-all pitch of 12 in., and the most this could be increased to was 18 in.

Since this was too small to accommodate the 21-in. high heat pump, it was decided to install the equipment in a drop ceiling area over the carport.

A 30-ft. section of sheet metal supply duct was prefabricated and insulated and slid into the 18-in. crawl space area during the construction of the house. It was then a simple matter to put in the branch supply runs prior to the installation of the sheetrock ceiling.

The homes are about 1,100 sq. ft. and year-round air conditioning is supplied by a Fedders model 830AH "Adaptomatic" with 5 kw's of supplementary resistance heating. The homes are FHA approved.

Air conditioning is heavily featured in the promotion of the homes, and the two models of the homes that are heat pump equipped are accounting for about one-third of the total sales in the Pierce-Uible project. Installation and service on the units is provided by the F. W. Murphy Co. of Jacksonville.




## Sales Engineer for Heat Pumps in Calif.

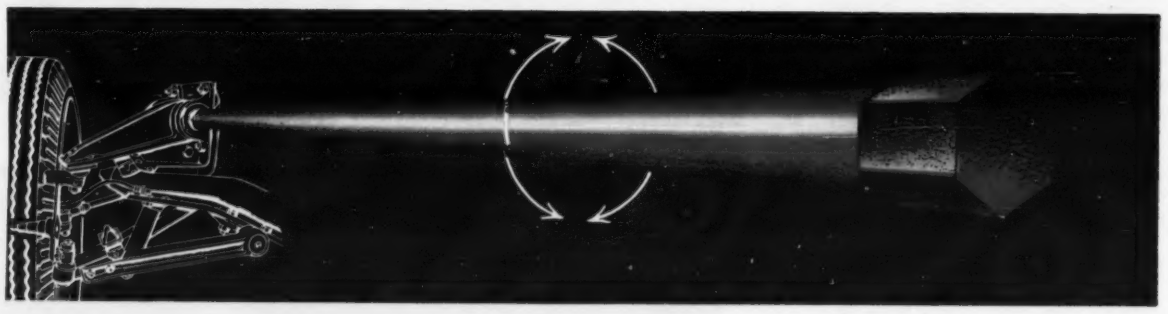
SALES ENGINEER, Packaged Heat Pumps. Largest Heat Pump Contractors in Southern California. Due to an outstanding merchandising program we just can't handle all of the business and are looking for an experienced, sharp sales engineer who can design, figure and CLOSE CONTRACTS without requiring someone to hold his hand. The right man should earn a minimum of $12,000.00 per year and closer to $20,000.00.

**BOX A6382, Air Conditioning, Heating & Refrigeration News**

**NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.**


# new torsion-spring ride!

**THE SMOOTHEST THING THAT EVER CAME BETWEEN A ROAD AND A LOAD!**



**Independent front suspension with tough torsion bar springs... for trucks!** Years in the making, this totally new suspension system protects everything from bumps and jolts . . . provides a new kind of performance that lengthens truck life, protects cargoes, reduces driver fatigue and cuts maintenance expense to new lows. Independently suspended, each front wheel steps cleanly over bumps. And the friction-free torsion bars work to absorb each jolt or jar; they flex freely, even on the smallest bumps, yet have the capacity to absorb severe shocks. The result is a truck ride so wonderfully smooth that it must be experienced to be believed! And it's now *standard* in *all* classes of 1960 Chevrolet trucks!

**Three tailored-to-the-truck rear suspensions** complement the revolutionary torsion bar independent front suspension. *In Series 10 and 20 models,* frictionless high-capacity coil springs ease the rear axle over bumps. *In Series 30* and 40 models,* a new two-stage leaf spring provides tailored springing action . . . *and in Series 50, 60, 70 and 80 models,* all-new variable-rate rear suspension gives spring resistance that adjusts automatically to cushion any size load.

**Optional at extra cost.*

# Chevrolet trucks for '60

*J. P. Glass Tells RACCA*

# Contractor Can Improve Profits by Using More of the Services Provided by Wholesaler

LOS ANGELES — The air conditioning and refrigeration contractor has the opportunity to improve his profits by taking more advantage of the services rendered by the refrigeration and supplies wholesaler.

That was the message presented by J. P. Glass, Chase Supply Co., Chicago, and past president, Air Conditioning & Refrigeration Wholesalers, to the annual convention of the Refrigeration & Air Conditioning Contractors Association here.

"The relationship between contractor and supplier must be one of trust," Glass said. "That same relationship also must be one of confidence. The supplier pledges to have material on hand at all times to satisfy his contractors' requirements — he pledges to deliver same to shop or job site.

"It is the supplies responsibility to keep the contractors abreast of current and new products—to furnish catalogs of his own or manufacturers' literature, and prices that are correct at all times. He must be in a position to answer questions relative to 50,000 items in some cases and well over 300,000 pieces. The supplier also must be sufficiently capitalized to handle any and all jobs that come his way. He must recognize his responsibility to the contractor in selecting his trade levels. His prices should represent uniformity to all.

"Having the necessary supplies when and where you, the contractor, want them, is helping to reduce your overhead. Efficient mass production without equally efficient mass distribution is worthless. Mass production at a profit, is in fact the result of efficient mass distribution—not the cause of it—as many seem to think.

"A very important function of the wholesaler is that he makes it unnecessary for the contractor to maintain large stocks of slow-moving materials. He anticipates the contractors requirements—assembles goods for him from all over the United States in economical quantities. Consequently, he maintains a reservoir of pipe, valves, fittings, etc., that the contractor can draw on.

"The wholesaler extends credit, reducing the contractors necessary investment, and in some cases makes it possible for your jobs to pay out before the bill for the materials purchased become due. Your wholesalers goods are guaranteed and warranteed, thus reducing your handling, your worry, and your overhead.

"The general public is just beginning to understand that it is the all-important availability of the numerous products that you contractors make available that help make possible our wonderful way of life. Availability, plus wherewithal to buy, make sales possible.

"It is all very well to read about a new type air conditioner or a new type of condensing unit in the trade papers or see them displayed at the all-industry show—but the 'big miracle of distribution' is the fact that you can obtain these items uniformly offered for sale all over the United States from your wholesaler.

### Wholesaler Should Be Viewed as Specialist

"The wholesaler, all too often, is looked upon as the unnecessary middleman in the distribution pattern. This is far from true. Our doctors are specialists —our lawyers are specialists— you contractors certainly are specialists as well as our manufacturers. If the foregoing are accepted as facts, then we must assume that economy and efficiency of specialization are also available in wholesaling.

"The wholesalers' major effort is to bring to his customer, materials at the best possible prices in the shortest period of time. This also helps to increase your profits.

"Solicit the cooperation of your air conditioning and refrigeration wholesaler. The existence of a wholesaler is to save you money. Utilize his services. Take advantage of his sales helps—the many sales clinics he holds—his promotional literature—his delivery service.

### 'Be Sure You Are Taking Advantage of Free Services'

"Examine your relationship. You may not be taking full advantage of all of the wholesalers' free services. Sell your services for what they are worth. Your vast knowledge should not be given away free of charge. Establish your profit margin. Then sell quality installations. Don"t just sell product alone.

"In summarizing, your wholesaler can help pave the way for your greater profits by learning your requirements. Don't hesitate to discuss your credit needs — your delivery needs — what day the supplier's salesman should call so that he does not waste your time. When he is there, don't let him gab about the weather. Put him to work. Let him take off materials for you, give you new products information, or check your stock, your prices, etc. Be sure he furnishes you with the sales aids you require.

"He is a specialist. In most cases he can help you trouble shoot on difficult jobs."

## Wilson Heads Mineral Wool Association

ABSECON, N. J.—M. M. Wilson, vice president in charge of sales of Baldwin-Ehret-Hill, Inc., Trenton, N. J., was elected president of the National Mineral Wool Association at its recent annual meeting here.

Wilson succeeds George D. Sudlow, home insulation merchandise manager of the U. S. Gypsum Co., Chicago.

Wade W. Hildinger, vice president in charge of sales of the National Gypsum Co., Buffalo, was elected vice president, and Harold H. Whittemore, sales manager, building products, The Flintkote Co., New York City, was re-elected treasurer.

new style, new models!

NEWLY ENGINEERED FOR EXTRA SAVINGS THROUGH EXTRA STRENGTH!

Rolling in on revolutionary torsion springs, these 1960 Chevies are smooth as silk yet tough as nails . . . totally new in scores of profit-boosting ways! In the light-duty class, for example, big new Series 40 chassis-cabs and stakes add to your earning power with G.V.W's up to 14,000 lbs. And virtually every model offers a new lower-to-the-ground build (without sacrificing road clearance) which improves truck stability and makes cab entry easier. In the big-truck class, too, Chevy for '60 sports big-profit G.V.W.'s – up to 19,500 lbs. in middleweights and 36,000 lbs. in heavyweights – with stronger components including new frames with more massive bracing and brawnier side rails, new bigger brakes, and the latest in low-cost V8 or 6-cylinder power.

**New Comfort-King Cabs!** There's more comfort than ever before, with 5 inches more shoulder room, 6 inches more hip room and more leg room and head room, too! A new wider seat, combining S-wire, coil and flat spring elements, offers a new high in easy riding. And Chevy's new double-walled cowl and new double-panel roof construction provide extra ruggedness and long life.

**New custom cabs!** Available in all 1960 cab models, they include distinctive exterior door pillar and rear belt line moldings . . . handsome chrome grille (light-duty models) . . . new Super Cushion Seat with foam seat cushion and backrest . . . sunshade, armrest, cigar lighter and control knob trim.

**New compact L.C.F. models!** Twenty-six new Chevrolet Low Cab Forward models with short cab design allow for maximum length trailers and extra cargo space. Short wheelbase and turning radius give exceptional maneuverability. Bumper-to-back-of-cab dimension is as short as 90 inches. G.V.W.'s go up to 25,000 lbs. and new cab design makes entering easier. And in series 50 and 60 models you can choose 6-cylinder or V8 power.

**New tougher built tandems!** They're the best built Chevy tandems yet with Hendrickson RT320 rear suspension, two 16,000-lb. Eaton rear axles and 7,000-lb. front suspension (9,000-lb. front suspension optional, extra cost).

**And they're POWERED to improve your profit picture, too!** Chevy for '60 offers a *wide* choice of better-than-ever power plants; in every weight class you can choose from famous economy 6's or V8's that lead the field for efficient short-stroke design! Three big sixes and four advanced V8's allow you to match the engine to your job for top performance.

Chevy's 1960 trucks with *total newness* are now on display at your Chevrolet dealer's, so stop by sometime soon! . . . Chevrolet Division of General Motors, Detroit 2, Mich.

CHEVROLET

with total newness!

# Wichita Residential System Sales Set New Record--

*(Continued from page 1)*

from 15 leading and representative contractors plus information from wholesalers.

These 15 firms, whose sales represent an estimated 75% of the total in the Wichita metropolitan area, noted a total of 1,019 residential air conditioning installations this year.

### No. of Contractors Holds Fairly Steady

In 1958 14 contractors claimed 825 residential cooling sales. Of these contractors 12 are listed in the 1959 survey. One of the firms missing in the 1959 figures dropped central residential air conditioning; the other closed its doors.

The three "new" contractors listed in the 1959 survey include two firms who have stepped up considerably their residential activities and a third (a long established concern) that simply didn't get its figures in soon enough to be included in the 1958 published results.

As is shown in the accompanying detailed tabulation, increases in sales of residential air conditioning were noted by eight of the 15 contractors listed. Five noted a decrease in sales, and two indicated no significant change.

(In the 1958 survey, published in the Nov. 10, 1958 NEWS, 10 contractors had indicated a drop in sales compared with 1957 while five noted an increase.)

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### Existing Homes Now The Big Market

Of the 1,019 residential cooling installations this year, 382 were installed in new homes at the choice of the speculative builder, 36 were installed in new homes at the choice of the buyer of the house, and 601 went into existing homes.

The 1958 breakdown was 243 to builders, 67 to buyers of new homes, and 482 to owners of existing homes.

There's no way of knowing for certain, of course, whether the 1959 breakdown ratios of the 1,019 sales would also apply to the additional 231 units estimated to have been sold. One could assume more or less safely, however, that because these additional units were sold by the smaller dealers, they mostly went into existing or custom-built homes.

Sales of residential heating systems by the 15 dealers listed in the 1959 survey totaled 2,566 compared with 2,036 noted for 14 dealers in the 1958 study. Of the 1959 heating installations 1,864 went into new homes and 702 into existing homes.

A considerable number of the residential heating installations involved cooling, too, and thus were year-round systems. Accurate estimates of year-round residential system sales, however, are impossible to obtain from most contractors, so speculation on this score would seem hazardous.

Two contractors did report the installation of eight residential heat pump systems, it should be noted.

### Some Improvement In Commercial Sales

Eleven of the 15 contractors listed in the accompanying table are also active in commercial air conditioning and heating. Their combined total installations amount to 230 commercial air conditioning systems and 175 commercial heating systems.

The 1958 totals of 14 contractors ran to 202 commercial air conditioning jobs and 195 commercial heating systems.

In both years many of these were year-round systems.

With respect to this data on commercial installations, it should be carefully remembered that they do not necessarily represent a true picture of the commercial field in Wichita—for two reasons.

First, the accompanying tabulation does not include certain firms, such as mechanical contractors, who hardly touch residential air conditioning and heating but whose activities in the commercial field can be considerable.

### Involved Situation In Commercial

Second, merely listing commercial jobs or units by the number gives no indication of their size and dollar volume. One contractor included in the 1959 survey, for example, notes fewer commercial installations this year but a considerably greater dollar volume.

Of the 11 firms reporting commercial installations in 1959, eight indicated gains in commercial cooling over the previous year, two indicated a reduction, and one remained about the same.

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There are 12 different makes of equipment represented in the sales of the 15 contractors listed in the 1959 NEWS survey. The total sales range all the way

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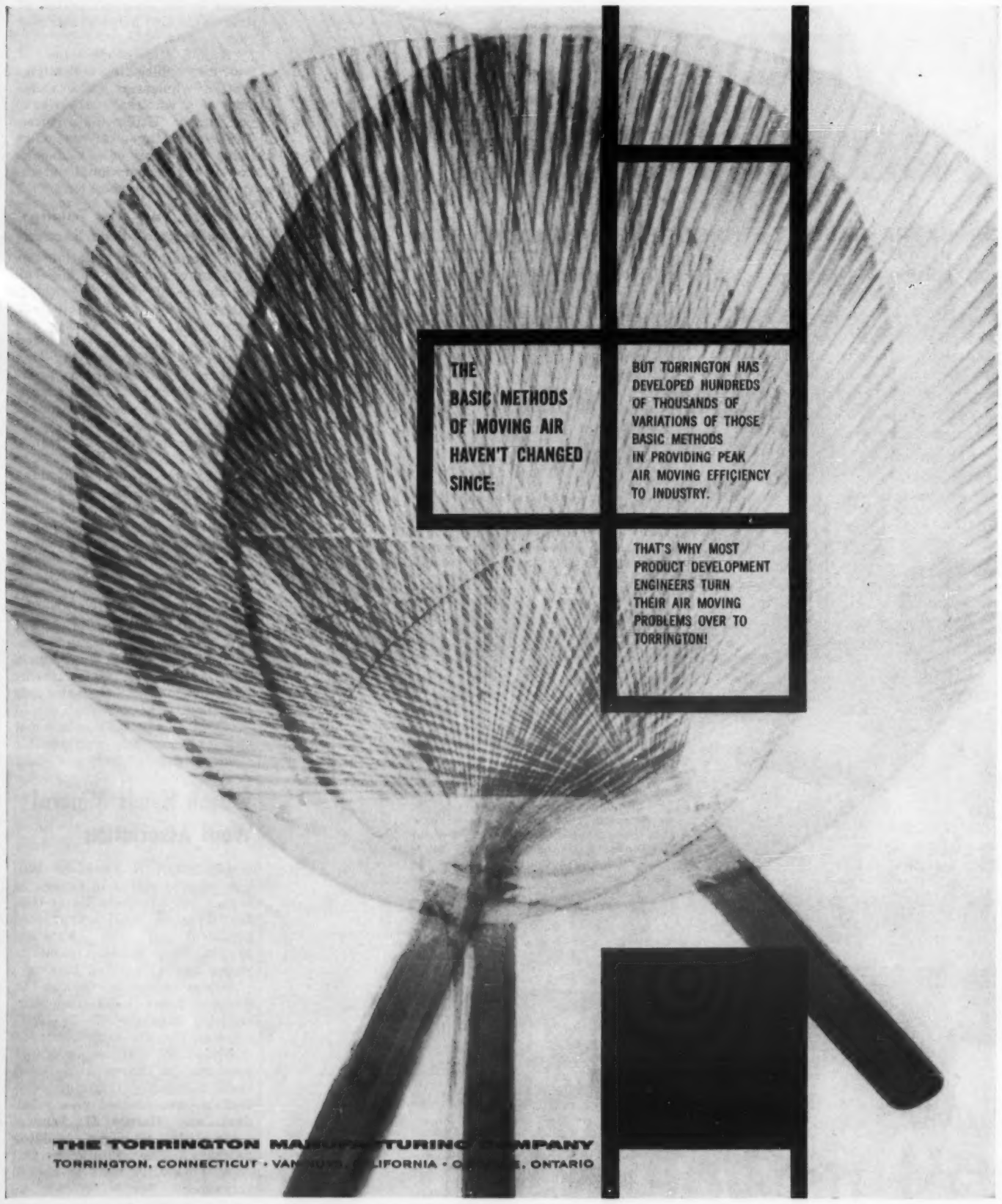
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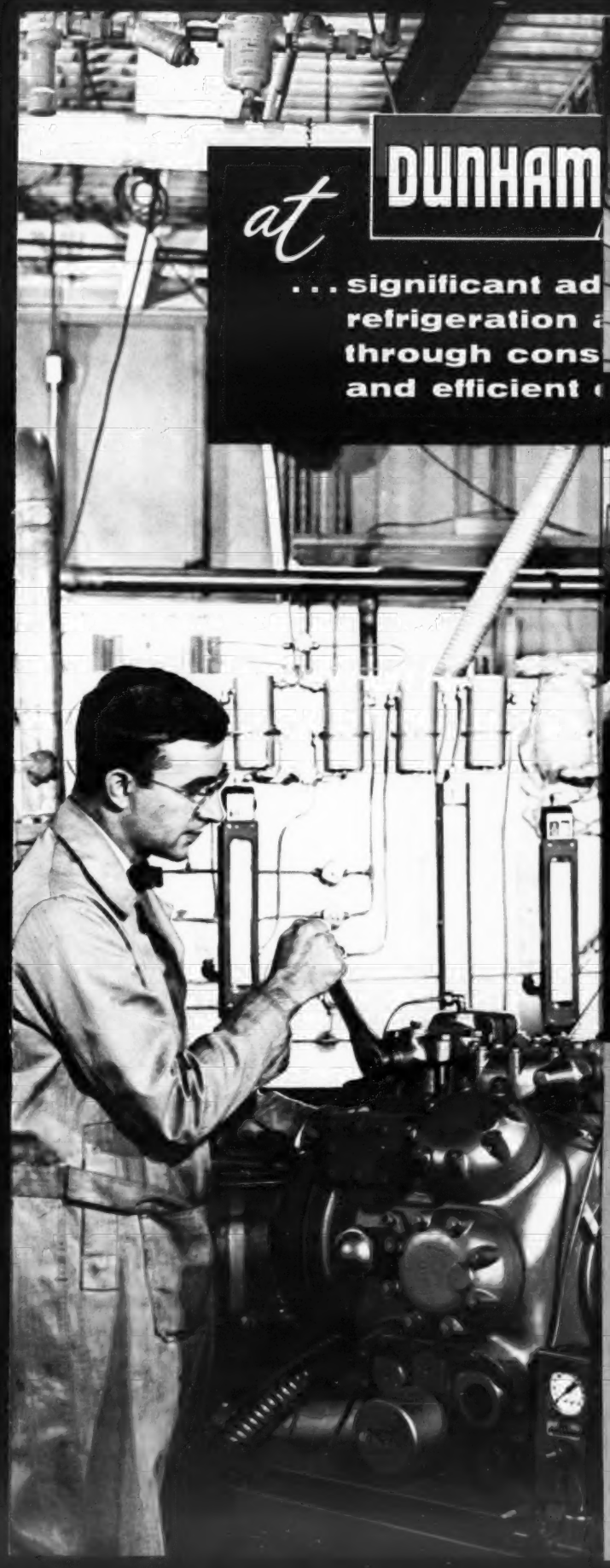

at DUNHAM

. . . significant ad
refrigeration a
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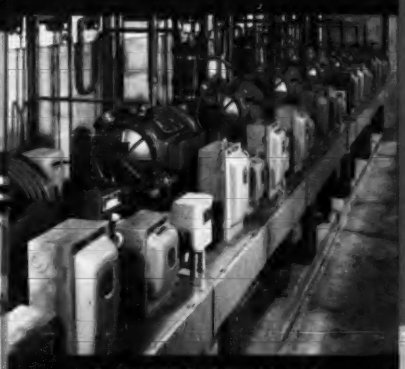
and efficient

'WJ' units in walk-in cooler



Brunner-mehr Condensing Units and Heat-X Pressure Stabilizers

DUNHAM-BUSH offers

A COMPLETE LINE

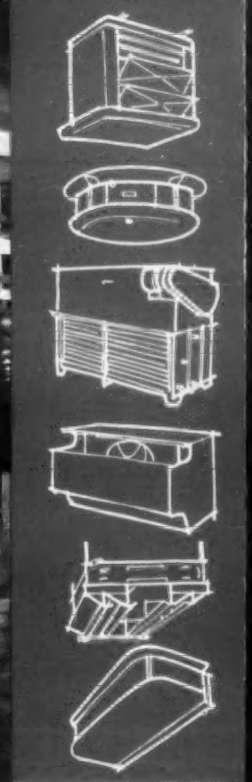
whether production specifications are for AIR CONDITIONING REFRIGERATION or HEATING

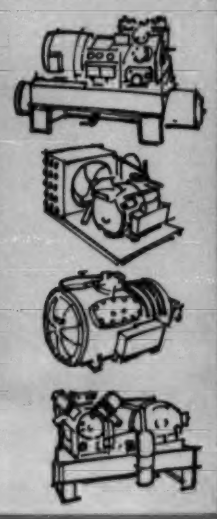
COOLING PRODUCTS
- Unit Coolers
- Product Coolers
- Plasti-Coolers
- Gravity Coils
- Comfort Coolers
- Air Handling Units
- 'LRCU' Large Remote Condensing Units
- Low Temperature Units
- 'DX', Water, Steam Coils
- Multizone Units
- Cooling Towers
- Packaged Air Conditioners
- Evaporative Condensers
- Air Cooled Condensers

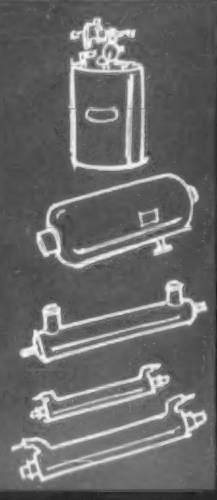
HEATING PRODUCTS
- Steam & Hot Water Specialties
- Convectors
- Vari-Vac
- Unit Heaters
- Pumps
- Baseboard Radiation
- Finned Radiation

HEAT-X PRODUCTS
- Liquid Cooling Equipment
- Heat Interchangers
- Condensers
- Package Chillers
- Industrial Heat Exchangers

BRUNNER PRODUCTS
- Refrigeration & Air Conditioning Condensing Units
- Air Compressors
- 'LP' Gas Units







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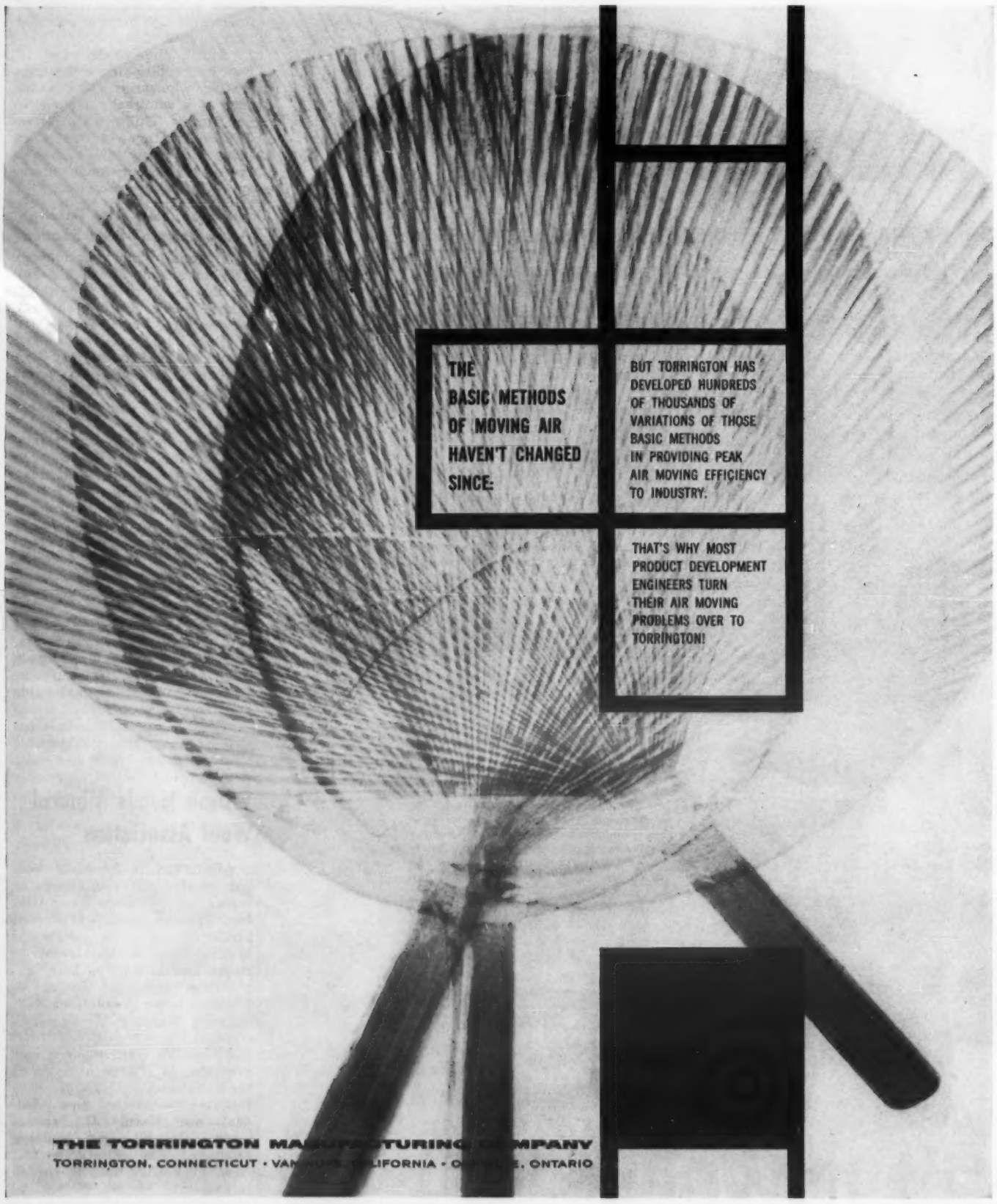
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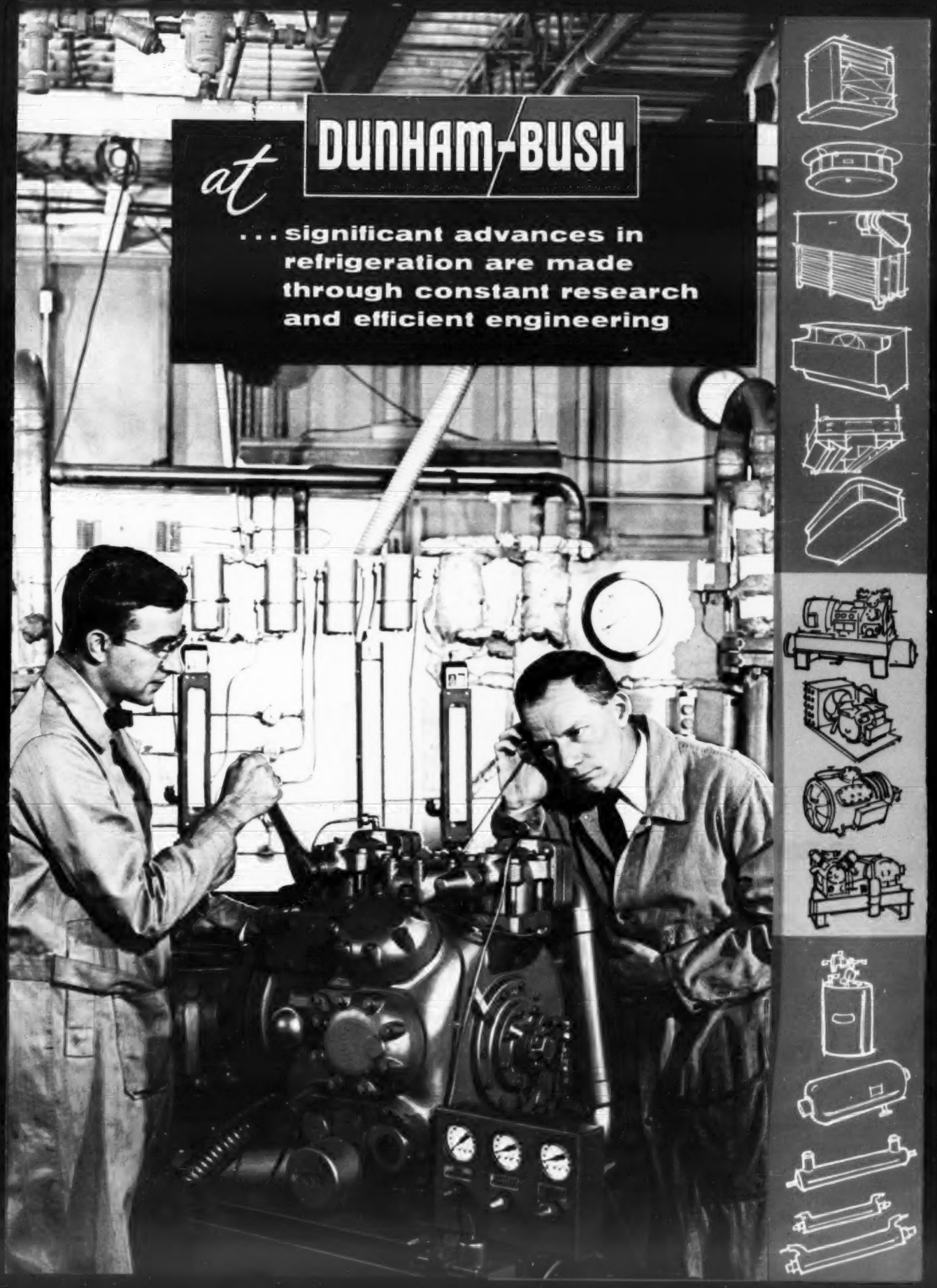
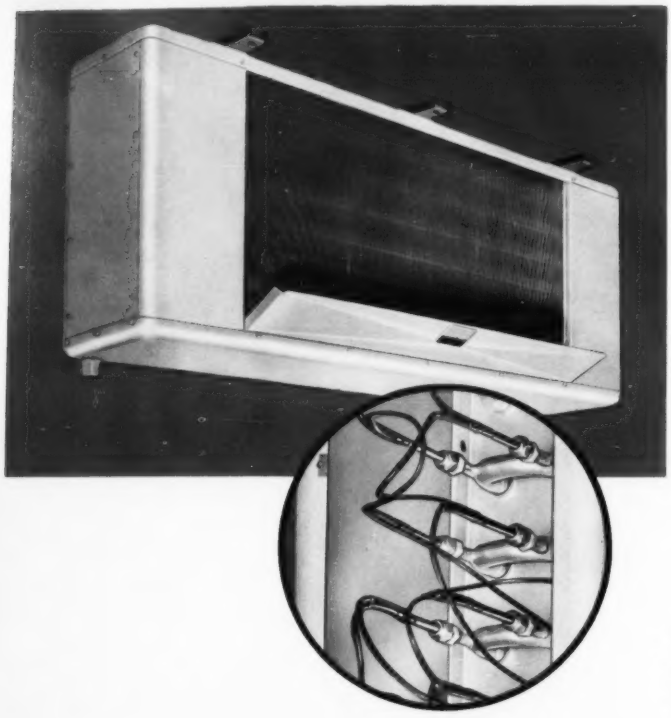

at DUNHAM-BUSH
. . . significant advances in refrigeration are made through constant research and efficient engineering

# A DIVERSITY OF PRODUCTS..... expression

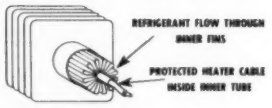
## Refrigeration products by DUNHAM-BUSH

From below zero applications to standard 35°-40° rooms you'll find a Dunham-Bush unit to fit any job. Typical is the 'ED' Electric Defrost Unit cooler featuring exclusive Inner-Fin coil construction, another example of Dunham-Bush research in action.



### 'ED'

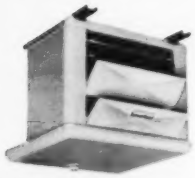
No defrost problems with these 'ED' Electric Defrost low temperature units. No waste heat! Electric cable provides maximum heat required for defrosting. Unit designed for easy servicing.




**HOW IT WORKS**

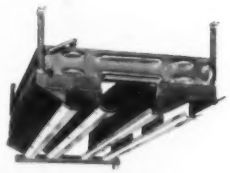
Exclusive Inner-Fin coil construction permits units to defrost from inside. Heater cable inside inner tube provides heat for defrosting. Refrigerant flow on cooling cycle is through inner-fins

## Product Range

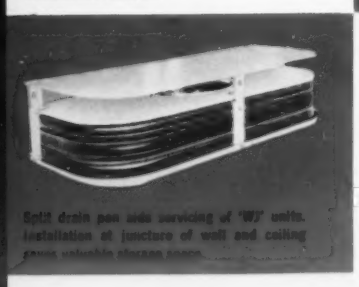


Nine standard sizes of standard 'UC' units offer flexibility in selection. Aluminum fins, copper tubing and baked enamel casings are construction features.

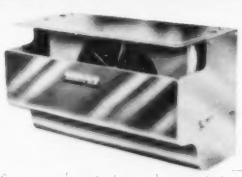
More storage space . . . 360° air discharge . . . sawdust screens . . . all plus features of the 'CU' line.



The most advanced evaporators in the field . . . Dunham-Bush Plasti-Coolers. Designed for high humidity conditions.



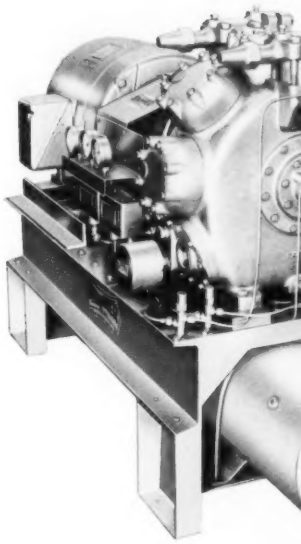
Split drain pan aids servicing of 'WJ' units. Installation at juncture of wall and ceiling saves valuable storage space.

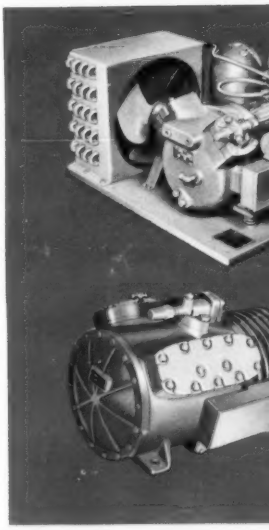


'JF' Jet-Flo units offer compact Inner-Fin coil construction. Two-way air flow adds to versatility.

Heavy duty product coolers ('RU' units) are available for above 32° storage in 1½ to 25 ton capacity and Glycol Defrost ('GD' units) for low temperature storage.

## BRUNNER uni





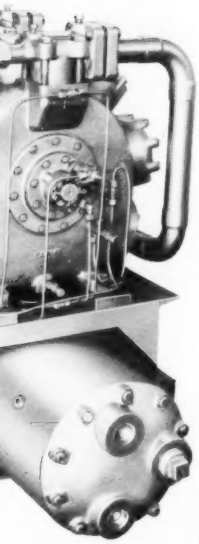
**BELT DRIVEN UNITS**

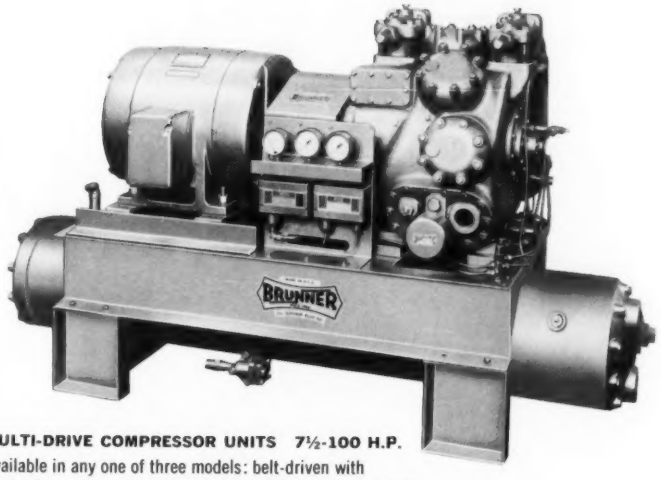
Unmatched in performance and q belt driven units are available models ¼-3 H.P., water coole and for remote condenser ap 100 H.P.

# ons of engineering

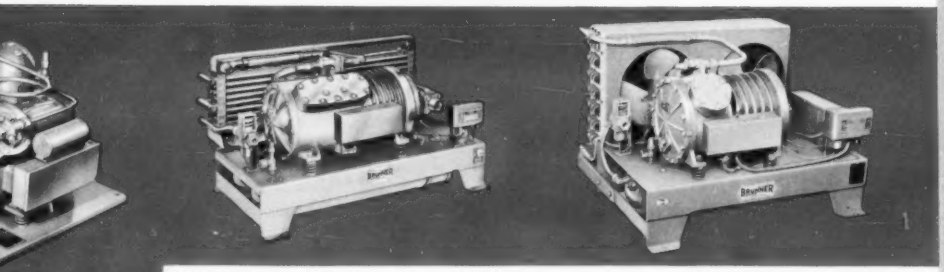
# *Achievement*

## units for refrigeration



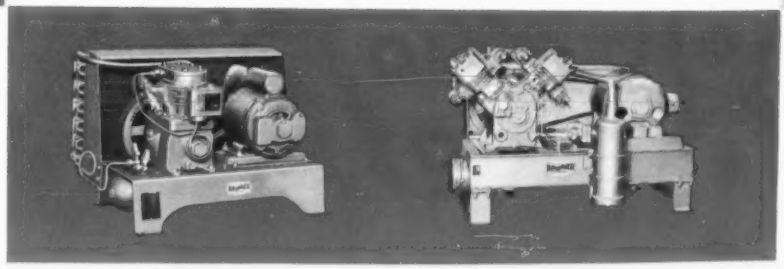



**MULTI-DRIVE COMPRESSOR UNITS 7½-100 H.P.**
Available in any one of three models: belt-driven with flywheel; semi-hermetically sealed with built-in motor; direct driven with motor coupling. These units are representative of the latest engineering advances from Dunham-Bush.



**BRUNNER-METIC CONDENSING UNITS**
Quality, top performance, and easy field servicing have made Brunner-metics prominently accepted and highly regarded in the refrigeration and air-conditioning industries. Brunner-metics are the result of many years of engineering experience and background in producing the very best in compressors and units.

Air cooled units ¼-7½ H.P.
Water cooled units ¼-15 H.P.
Motor compressors are available ¼ through 15 H.P.



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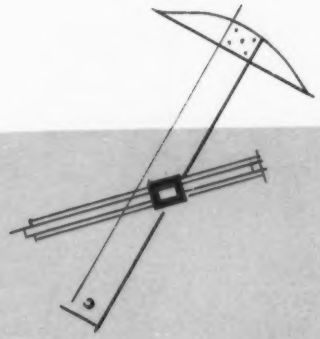


**Product Integrity**
**Designed For**
**Complete Satisfaction**

You can specify Dunham-Bush and be sure. This One Source—One Responsibility line is your assurance of trouble-free jobs. Wide range of sizes and models, and technically correct design and consumer eye-appeal make this line a top favorite of leading architects, consulting engineers and contractors.

DUNHAM-BUSH

heat-x BRUNNER SINCE 1906

'WJ' units in walk-in cooler

Brunner-metic Condensing Units and Heat-X Pressure Stabilizers

**DUNHAM-BUSH** *offers*

## A COMPLETE LINE

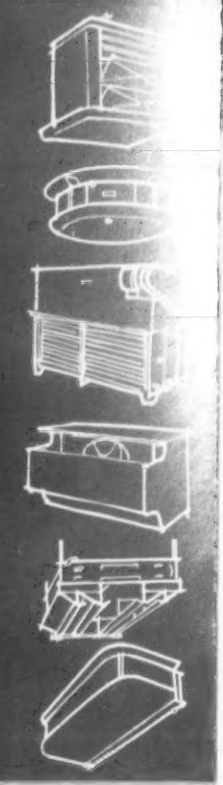
whether production specifications are for AIR CONDITIONING REFRIGERATION *or* HEATING

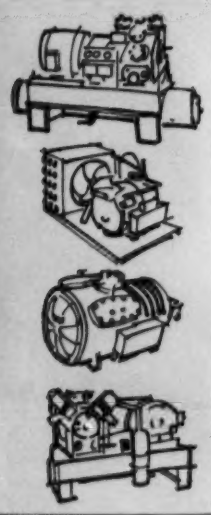
**COOLING PRODUCTS**
- Unit Coolers
- Product Coolers
- Plasti-Coolers
- Gravity Coils
- Comfort Coolers
- Air Handling Units
- 'LRCU' Large Remote Condensing Units
- Low Temperature Units
- 'DX', Water, Steam Coils
- Multizone Units
- Cooling Towers
- Packaged Air Conditioners
- Evaporative Condensers
- Air Cooled Condensers

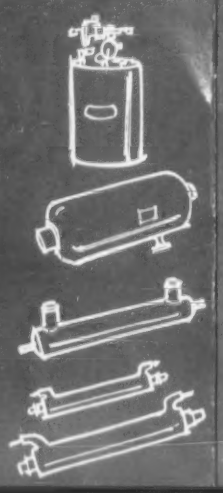
**HEATING PRODUCTS**
- Steam & Hot Water Specialties
- Convectors
- Vari-Vac
- Unit Heaters
- Pumps
- Baseboard Radiation
- Finned Radiation

**HEAT-X PRODUCTS**
- Liquid Cooling Equipment
- Heat Interchangers
- Condensers
- Package Chillers
- Industrial Heat Exchangers

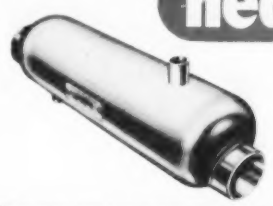
**BRUNNER PRODUCTS**
- Refrigeration & Air Conditioning Condensing Units
- Air Compressors
- 'LP' Gas Units







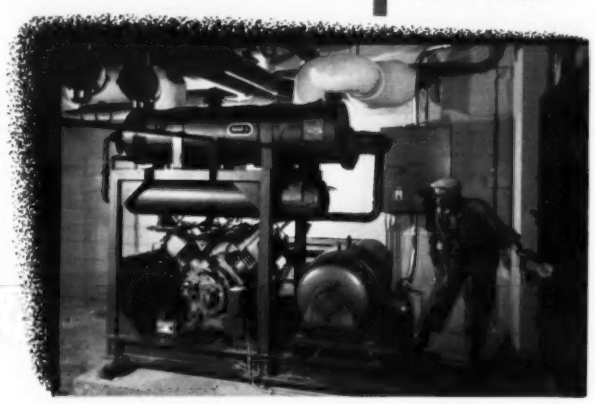
## heat-x



Heavy duty heat interchangers feature Inner-Fins on the suction line which provide maximum heat transfer with very low pressure drop . . . Units feature low Refrigerant charge.

HEAT-X Coolers are Direct Expansion Coolers of the simplest design and do not require oil separator or surge drum. Both refrigerant and liquid circuits are continuous tubing cast in aluminum. There are no internal moving parts.

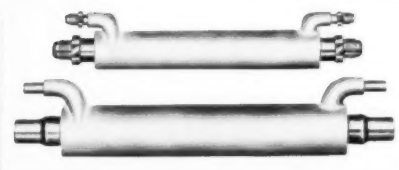
'OSM' Oil Separator-Mufflers silence system noises and separate entrained oil. No floats to cause trouble. Available in capacities 1 to 75 tons R-12 and 1 to 100 tons R-22.



Typical installation of Package Chiller on large chilled water installation.

Heat-X Cleanable Shell & Tube Condensers are available in a wide range of sizes, 5 thru 100 tons. These heavy duty, high capacity condensers are specifically designed to provide for easy mechanical cleaning as required by poor water conditions.

Cleanable Inner-Fin Condenser's entire water circuit is of non-ferrous construction, with cleanable tubes, making high efficiency possible. Inner-fins permit a compact arrangement and provide extra square feet of surface.



Heat-X Heat Interchangers are tops in the field. Highly efficient inner-fins in the suction line provide for minimum pressure drop . . . maximum heat transfer.

Heat-X Inner-Fin Shell and Tube Condensers feature patented Inner-Fin construction—making these the most compact shell and tube condensers on the market. All water passages are of non-ferrous construction, eliminating any corrosion problem.

# Dunham-Bush, Inc.

**DUNHAM-BUSH**

179 SOUTH STREET • WEST HARTFORD, 10 • CONNECTICUT, U.S.A.

MICHIGAN CITY, INDIANA • MARSHALLTOWN, IOWA • RIVERSIDE, CALIFORNIA

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DUNHAM-BUSH, LTD. PORTSMOUTH, ENGLAND

BRUNNER CORPORATION (CANADA) LTD. PORT HOPE, ONTARIO

FORM NO. 510

160M 10/59 R

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## Wichita--

*(Concluded from page 22)*

from a high of 243 units, representing 24% of the 1,019 total, to a low of 10 units. One make is represented by 180 units for 18%, another by 149 for 14%.

If the Wichita 1959 sales follow the pattern developed by the five previous NEWS surveys, perhaps another dozen makes would be represented in sales by the numerous small contractors who operate in the area.

Information that might cast some light on distribution patterns in residential air conditioning was also sought in this survey. A total of 726 units, 71% of the 1,019 listed, was purchased directly from the manufacturer by nine dealers. The balance of 293 units, 29%, came from franchised distributors. No units were purchased from independent parts and supplies wholesalers by the dealers surveyed.

### Who Do They Buy From?

In comparison, in the 1958 survey it was learned that six dealers who bought direct from manufacturers had sales of 396 units while the eight who bought from distributors had a combined total of 429 residential air conditioning sales.

Generally, the same buying pattern is followed in all four categories of residential cooling and heating, commercial cooling and heating.

As for stocking of equipment in advance of sale, this is done by seven of the 15 contractors whose total sales amounted to 563 residential cooling units in 1959. The other eight contractors, with a total of 456 residential cooling sales this year, maintain no warehouse stock although they may have a limited number of units on display.

Just as was done in previous surveys, an attempt was made to learn whether contractors had any special success formulas or not with respect to advertising, promotion, and/or sales.

With only one exception, nothing really startling came out of this inquiry. The usual answers of a limited amount of newspaper, direct mail, television, and radio advertising were mentioned. "Direct contact" was expression most often used to explain sales.

### Direct Mail Service Offer a Big Hit

One contractor, however, has racked up what would appear to be a most remarkable record of response to a direct mail approach. In August he sent out 3,000 cards offering a $6 special on cleaning of gas furnaces which also included installation of filters, oiling of blower, etc.

As of Oct. 10, replies had been received from 1,127, which must be something of a record. (Comparable results were achieved last year, however, this contractor says.)

In addition to this profitable service work, which has kept nine men working, the company has already sold three new heating installations plus a great number of repair parts.

The contractor does not doubt either that the contacts with customers so achieved will pay off in future sales of both heating and air conditioning.

## How Wichita Residential Contractors Fared In 1959

(Based on Sales Through Oct. 10)

| Contractor | 1959 Total | Residential Cooling: New Homes Bldr. | New Homes Buyer | Existing | Residential Heating: New | Existing | Commercial Cool. | Commercial Htg. | Residential Dollar Volume: Cool. | Residential Htg. | Commercial Cool. | Commercial Htg. | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 188* | 188 | .... | .... | 600† | .... | .... | .... | —100%— | | ..... | ..... | ..... |
| 2 | 180* | 77 | 4 | 99 | 171* | 53* | 67* | 81* | 42% | 26% | 19% | 10% | 3% |
| 3 | 149* | 40 | .... | 109 | 450* | 207* | 16* | 17* | 30% | 50% | 12% | 8% | ..... |
| 4 | 96† | 10 | 8 | 78 | 9† | 20† | 38† | 15† | 70% | 5% | 20% | 5% | ..... |
| 5 | 75 | 10 | 5 | 60 | 400 | 200 | .... | .... | 23% | 77% | ..... | ..... | ..... |
| 6 | 50† | .... | .... | 50 | .... | 15 | 18* | 15* | —11%— | | —77%— | | 12% |
| 7 | 49* | 5 | .... | 44 | 18* | 26* | 9* | 13* | 33% | 25% | 5% | 7% | 30% |
| 8 | 40* | .... | .... | 40 | .... | 30* | 9* | 1* | —75%— | | —25%— | | ..... |
| 9 | 39† | 18 | .... | 21 | 16 | 17 | 17† | 12† | 15% | 10% | 40% | 15% | 20% |
| 10 | 36* | .... | .... | 36 | .... | 13† | 38* | 11† | —30%— | | —65%— | | 5% |
| 11 | 31* | 17 | .... | 14 | 19* | 21* | 1* | .... | 53% | 42% | 5% | ..... | ..... |
| 12 | 30 | 10 | 10 | 10 | 100 | 60 | .... | .... | 60% | 35% | ..... | ..... | 5% |
| 13 | 21* | 2 | 4 | 15 | 6* | 5* | 12* | 5* | NA | NA | NA | NA | NA |
| 14 | 20† | 5 | 5 | 10 | 75* | 25* | 5 | 5 | 8% | 8% | 2% | ..... | 82% |
| 15 | 15† | .... | .... | 15 | .... | 10 | .... | .... | 50% | 25% | ..... | ..... | 25% |
| Total | 1,019 | 382 | 36 | 601 | 1,864 | 702 | 230 | 175 | ..... | ..... | ..... | ..... | ..... |

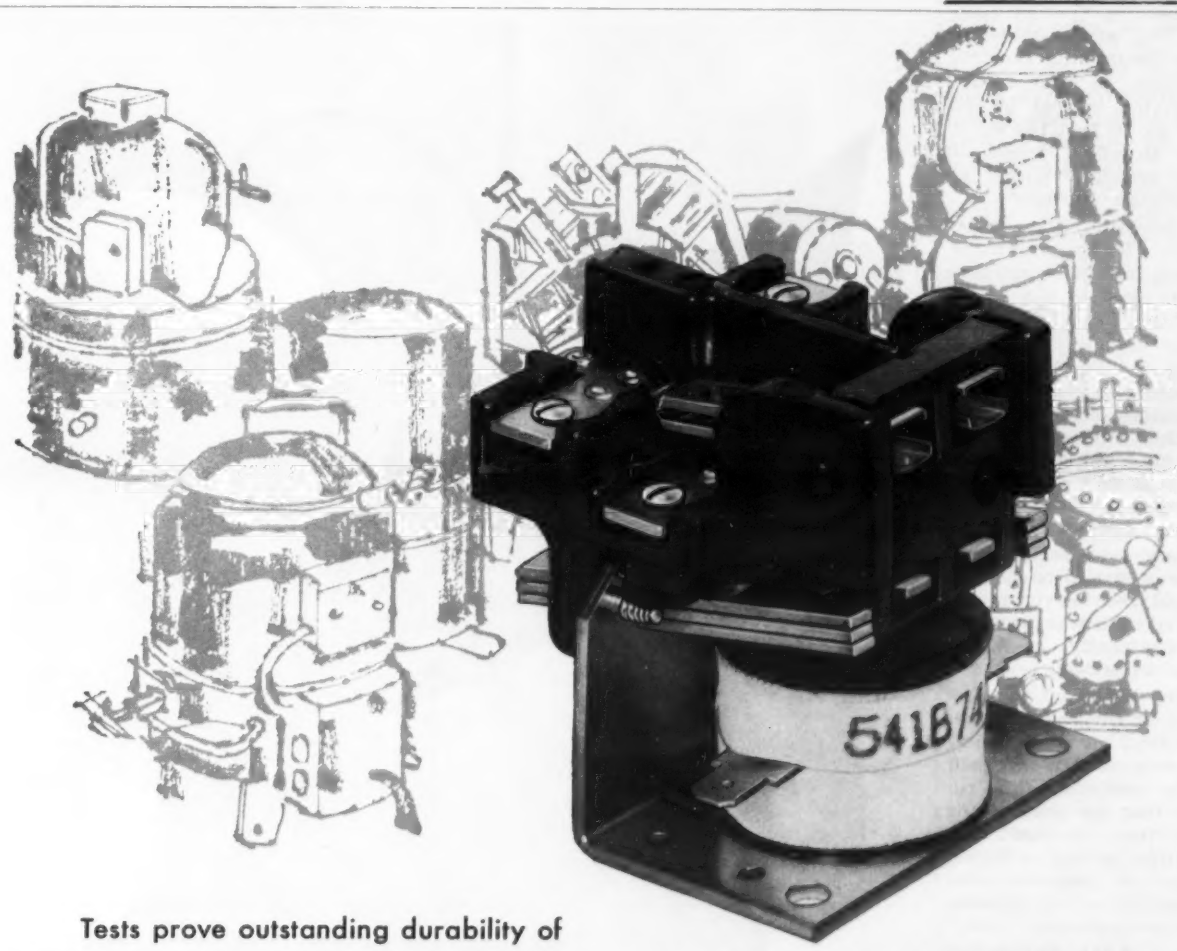
*Up from 1958. †Down from 1958.

## Embassy Opens Warehouse In Alaska

BROOKLYN—Embassy Steel Products, Inc. here, manufacturer of heating and cooling equipment, has announced the opening of a warehouse in Anchorage, Alaska.

Embassy said the facility is one more link in its planned network of national warehouse locations. The company maintains warehouses in Cambridge, Mass., Chicago, and Brooklyn—and plans shortly to open several in the Midwest and on the West Coast.

**REPRINTS**
**SELLING FOR PROFIT.**
By Frank Klein—Only $1.00 ea. Clip this ad and mail with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.



Tests prove outstanding durability of

**GENERAL ELECTRIC'S NEW CONTACTOR**

**EXHAUSTIVE LOAD-LIFE** tests (in excess of 300,000 operations—make LR and break 125% of full-load current) have proved General Electric's new magnetic line contactor will give you dependable, long life operation in your air conditioning systems.

Recent tests at General Electric's Appliance Control Department subjected a 3ARR8 line contactor to a 40-day test that simulated 10–20 years of installed service. Test engineers reported that the Company's new contactor—designed for central residential air conditioning systems—passed tests two to three times greater than those required by industry standards.

**PRACTICALLY FREE** from contact bounce, the new G-E contactor is used for applications such as starting and stopping compressor and fan motors and auxiliary heating circuits on central air conditioning systems.

One-half pound contact pressure per pole provides positive make. Available weld breaking force of over two pounds per pole provides positive break. And the "kiss-free" action for all pick up and drop out voltages eliminates the greatest cause of contact failure.

**FOR MORE INFORMATION,** contact your General Electric Apparatus Sales Office or write Section 740-141, General Electric Company, Schenectady, N. Y. (Ask for GEA-6803A.)

QUALITY CONTROLS FOR YOUR REFRIGERATION AND AIR CONDITIONING APPLICATIONS

**Temperature controls**
**Current and voltage-type accelerating relays**
**Magnetic line contactors**
**Motor overload protectors**
**Air conditioning panels**
**Heating-cooling thermostats**

*Progress Is Our Most Important Product*

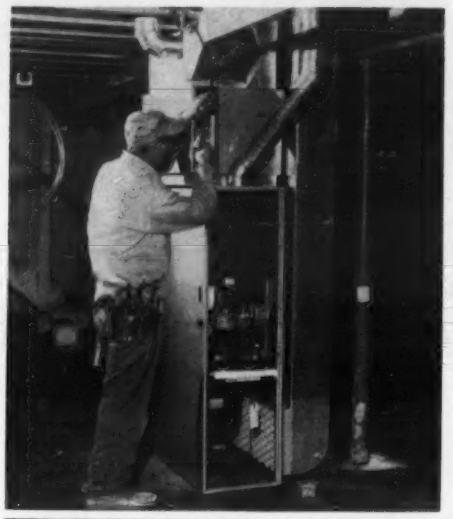
GENERAL ELECTRIC

*Air Conditioning Influenced 50% of Buyers*

# 290 of 300 Homes In Columbus Tract Sold with Year-Round Air Conditioning

## *Radio, Television, Buscards, Billboards, Newspapers Employed*

JACKIE McQUAID, left, one of several models who served as a hostess on opening day and the following three weeks, poses with Robert Horton in front of the "Dolly Madison," one of five Jewel model homes which featured year-round air conditioning.



A CRESTVIEW engineer installs a line from the Century cooling unit to an outdoor compressor. The centrally located utility closet also contains the furnace.

COLUMBUS, Ohio — Proving that air conditioning for homes can be sold in the North if it is merchandised effectively, Jewel Builders here sold 290 of 300 medium priced homes with air conditioning this year.

The homes, in the Homestead subdivision in southeast Columbus, ranged in price from $13,750 to $15,250, including air conditioning. The air conditioning and heating package was manufactured by Century Engineering Corp. and installed by Crestview Contracting Co.

The homes, in four models and 16 styles, ranged in size from 946 sq. ft. to 1,143 sq. ft. They are "Medallion" homes, all brick, and include Westinghouse built-in kitchen appliances.

The subdivision first opened last May. Radio, television, newspapers, billboards, and buscards were used to stir up interest—with central air conditioning featured prominently.

Opening day, Sunday, May 3, was unusually hot and humid. Crowds milling outside sweltered until they were able to step inside the air conditioned homes. Then they experienced, better than any salesman could express it, their cool comfort.

The Jewel air conditioning message was carried on 22 billboards, and 164 television and 438 radio spots. It was also mentioned prominently in heavy newspaper advertising.

A survey of 58 of the first purchasers of Homestead homes indicated that air conditioning was a prominent factor in their decision to purchase. Fifty per cent said that air conditioning influenced their decision. Only other factors getting a higher percentage of mention were brick construction and kitchen and built-in appliances.

As a test of the effectiveness of promotional media, the purchasers were asked where they first heard about Homestead.

Some 34.5% said they first observed the subdivision while driving by. Thirty-one per centfrom TV, 3.4% from radio, and said they read about it in the3.4% did not recall.
newspapers, 15.5% heard about Some of the Jewel homes are
it by word-of-mouth, 12.1% built on slabs, while others

**AN UNUSUAL OPPORTUNITY**

One of the oldest manufacturers of trailer and truck refrigeration requires sales representation in the following territories:

Kansas City
St. Louis
Cincinnati
Buffalo
Rochester

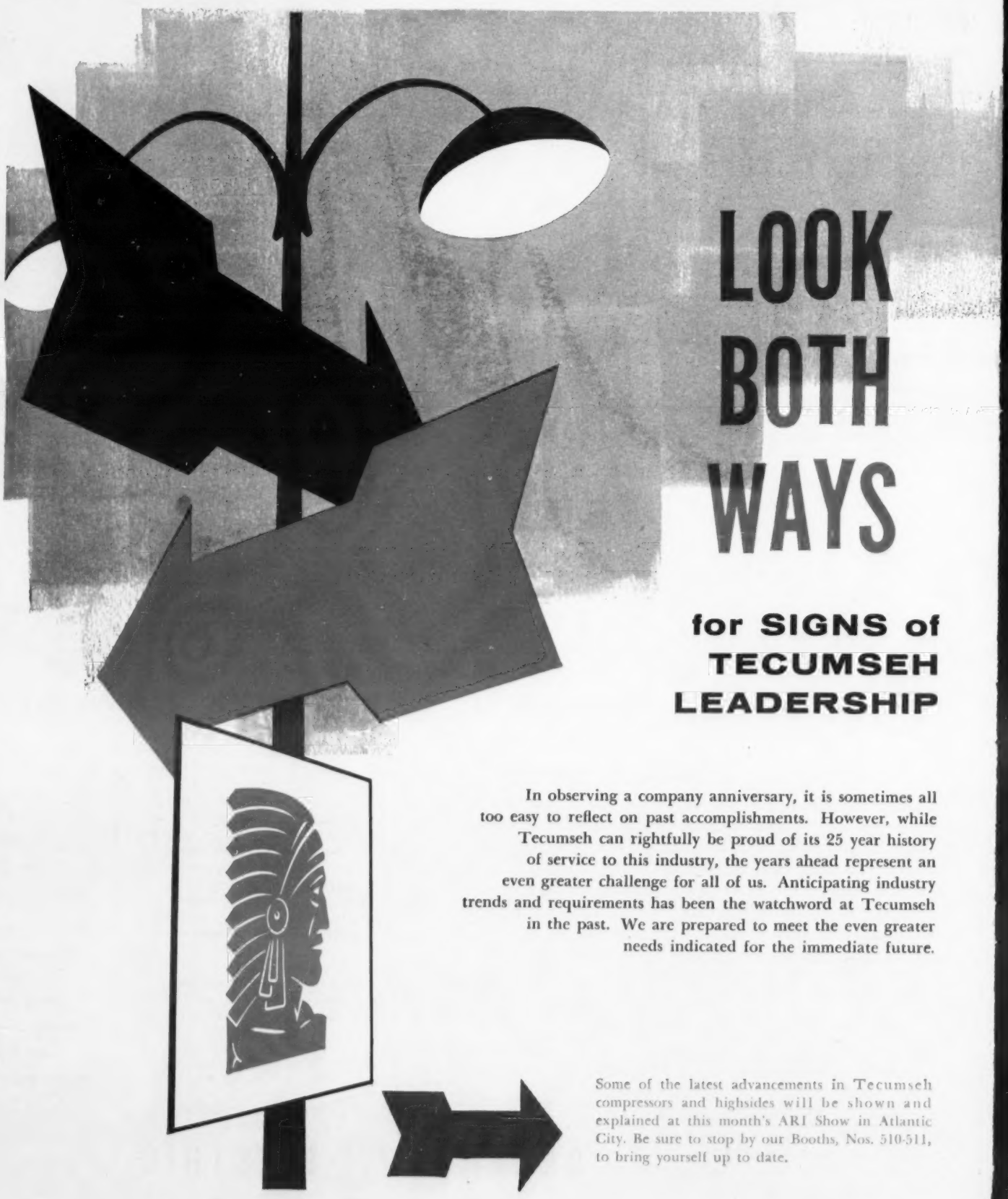
Manufacturers agents interested in handling the number one line of trailer and truck refrigeration reply to BOX A6383, Air Conditioning, Heating & Refrigeration News, furnishing the following information: Lines handled, territory covered, and length of time in business.

**SEND FOR REPRINTS**

"ELECTRICAL CHARACTERISTICS OF PACKAGED AIR CONDITIONING UNITS."

Only 25¢ each.

For your copy, clip this ad and mail with name and address to: Air Conditioning, Heating & Refrigeration News. 450 W. Fort, Detroit 26, Mich.




**for SIGNS of TECUMSEH LEADERSHIP**

In observing a company anniversary, it is sometimes all too easy to reflect on past accomplishments. However, while Tecumseh can rightfully be proud of its 25 year history of service to this industry, the years ahead represent an even greater challenge for all of us. Anticipating industry trends and requirements has been the watchword at Tecumseh in the past. We are prepared to meet the even greater needs indicated for the immediate future.

Some of the latest advancements in Tecumseh compressors and highsides will be shown and explained at this month's ARI Show in Atlantic City. Be sure to stop by our Booths, Nos. 510-511, to bring yourself up to date.

are built with full basements.

In the slab-type homes, air conditioning units are located in a central utility closet which also houses the water heater.

The heating and cooling air distribution system uses rigid glass fiber ducts through attic spaces to overhead air diffusers. Ducts are covered with a vapor barrier at the factory.

Air-cooled 2-hp. condensing units are located at the rear of the houses. Highly insulated refrigerant piping extends through the attic space between condensing unit and evaporator unit. A plastic pipe leads from the drip pan under the evaporator to a drain in the floor.

In the basement houses, an extended plenum perimeter air distribution system feeds low sidewall and extended baseboard diffusers. A single return air grille is mounted low on an inside wall.

NEWSPAPER ADS like the one above were part of the campaign used to promote Jewel homes equipped with air conditioning. In addition, the builder used radio, television, billboards, and buscards.

## Airtemp Names Outlet For Detroit Area

DAYTON—Appointment of C. Carson Merchandisers, Detroit, as distributor for Chrysler Airtemp packaged cooling and heating products in that area has been announced by J. B. Ogden, Airtemp vice president-sales.

At the same time, Ogden disclosed that Airtemp's Detroit branch has been closed.

Earlier this year, C. Carson Merchandisers was appointed an Airtemp room air conditioner distributor.

### Harris Heating Formed

SPINDALE, N. C. — Harris Heating Service, Inc. here has obtained a charter from Secretary of State Thad Eure to deal in heating equipment. Authorized capital stock is $100,000.

## Worldwide 'Conversation' about Home Cooling

GROWING TREND toward central air conditioning in homes was discussed in a radio program over KFI, Los Angeles, by J. R. Merrill, left, advertising manager of Lennox Industries, Inc. Merrill appeared on the popular nighttime show, "Conversation," as guest of Al Poska. The show has listeners all over the United States as well as in many foreign countries. Merrill graphically described the method of combining central air conditioning with the forced warm air heating system, both in new and conversion installations.

## Old Town Apartments Get Cooling

CHICAGO — Space-age comfort, including air conditioning, in a picturesque colonial setting is the combination in store for tenants of Williamsburg Gardens, a renovated Old Town apartment building nearing completion at 1800 N. Wells St. here.

The project of Old Town Restoration Ltd. features 16 all-electric units. The modern duplex, patio, and studio apartments have materialized within a brick shell that enclosed four ancient buildings at the site seven months ago.

Retaining only the outer walls of the old structure, builders Houston-Warren faced them with "Redi-brick," Williamsburg-styled with gables, shutters, and wrought iron balconies. Inside, they fitted eight duplex apartments and eight smaller units.

The apartments include such features as living rooms paneled in hardwood, acoustical tile ceilings, wall to wall carpeting, interior balconies, ceramic tiled baths, breakfast bars, and telephone jacks in every room.

The units are being equipped with electric radiant baseboard heating, accented by copper hooded, mosaic tiled electric fireplaces. Other electrical conveniences are air conditioning, 100-ampere wiring and kitchen assemblies of built-in oven and range units, refrigerators, and water heaters.

Future buildings of Old Town Restoration Ltd. include a 28-apartment cooperative at Eugenie and North Park. In the planning stage is a 50-apartment high-rise building in Old Town, location of the firm's operations. Both buildings will be all-electric.

## PHCIB Elects Officers; Fitzpatrick Is President

ATLANTIC CITY, N. J.—William A. Fitzpatrick, general manager, M. J. Gibbons Supply Co., Dayton, was elected president of the Plumbing-Heating-Cooling Information Bureau at a meeting of the board of directors in the Haddon Hall hotel here.

Other officers elected are: Lee Martin, president of Nibco, Inc., Elkhart, Ind., vice president; John M. Dumser, director of sales, Wolverine Tube, division of Calumet & Hecla, Inc., Allen Park, Mich., treasurer; Norman J. Radder, secretary; and Norman Wicks, executive director.

**NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.**

25 YEARS OF STEADY GROWTH

The ability to design a more efficient compressor, match it to the specific application, and mass-produce it to pass along greater savings to our customers, has been responsible for Tecumseh's growth over the past twenty-five years. Accordingly, the early compressors and condensing units shown at the right have long been obsoleted. As a matter of fact, every model produced as recently as five years ago has since been replaced. This program of constant product improvement has made Tecumseh its own best competition. You have profited from it.

AHEAD . . . NEW HEIGHTS FOR INDUSTRY

And, prepared for this continuing industry growth, only Tecumseh stands fully ready to meet product requirements in sufficient volume. New compressor models will also carry built-in economies, providing our customers with an added advantage. Important size and weight reductions were realized in this year's Tiny-T and AU Pancake models. Even greater cost savings will be offered in our new CL-series compressors, designed for residential air conditioning applications. In the past as well as in the future, only the assurance that you are getting the best product at the lowest price remains constant at Tecumseh.

TECUMSEH

*The Leader Serving Leaders in the Air Conditioning and Refrigeration Industries*

**TECUMSEH PRODUCTS COMPANY**

MARION, OHIO — TECUMSEH, MICHIGAN

FOREIGN OPERATIONS DIV: P. O. Box 2280, 24530 Michigan Ave., W. Dearborn, Michigan

CANADA: Tecumseh Products of Canada Limited, 1667 Dundas St., London, Ontario.

**Temperature Tests Indicate It Might**

# *Would Constant 0°F. for Frozen Foods Force Grocers Out of the Business?*

GROSSINGER, N. Y.—If a code were ever adopted requiring 0° F. for frozen foods at all times, the retail grocer would be out of the frozen foods business, asserts Gerrit Vander Hooning, operator of Van's Food Department Stores, Inc. in Holland, Mich.

Not only would a grocer be unable to accept frozen foods from the deliveryman, but his display cases would not hold 0° F. if he did, he adds.

Vander Hooning reported recently to the National Association of Retail Grocers on a test he made of frozen food temperatures in his store.

The test was part of a NARGUS survey which gathered data from retailers across the country regarding temperatures at which they receive frozen foods and at which they are able to keep them in both display cases and in storage.

Vander Hooning's test covered four weeks beginning last Aug. 10. His frozen foods equipment consists of 120 ft. of frozen food display cases including 36 ft. for ice cream and two large freezers measuring 8 by 24 ft. for frozen food and 8 by 12 ft. for ice cream. All of the equipment is less than two years old.

Here are the results, as reported by Vander Hooning:

"Our two freezers have averaged from -2 to -10° F. all through the tests. But display cases are a different story. We took two readings a day—one between 8 and 9 a.m. (three hours after defrost cycle) and the other at 6 p.m. (3½ hours after defrost cycle).

"Even with the cases low in some sections, well below the so-called 'safety line,' temperatures in those cases ranged from 2 to 18° F. Remember, this was not after stocking the case at any time.

"We selected the early morning hours because of the small amount of traffic and after a night when the market should really be cooled completely, since it is air conditioned.

"I should point out that our ice cream case has maintained a consistent temperature of -2 to -10° F. Under the code we would be out of the frozen foods business entirely, but could sell only ice cream.

"Let's go back a little further. We couldn't have accepted a single package or item, either, if we had lived up to the code. And that would include ice cream as well.

"We began a check on frozen foods coming into the store and really had a shock. On Wednesdays we get a small shipment on the regular grocery truck. They have two or three large insulated chests, holding about 35 cartons of merchandise each.

"The first time we checked a shipment, the temperature in chests (Aug. 12) was 38° F. in one and 42° F. in the other.

"We were told the chests were rolled into the big freezers at night, loaded there, then dry ice placed in them, and then rolled into the grocery delivery truck against the wall, with all grocery delivery packed around them. This was supposed to hold the cold!

"In the four-week test, and with the cooperation of the frozen foods supervisor from our warehouse the last two weeks, the best we have ever been able to record was a 32° F., a 10° F., and a 28° F. in those holding boxes.

"On Friday mornings we receive the larger shipment of frozen foods in the so-called frozen foods trucks. The lowest temperatures we have been able to get in the low temperature equipped trucks were 18° F. all the way up to 34° F.

"We then checked packages, opening a carton quickly and placing a thermometer in the center of the case, closing the case and packing other cartons around it.

"The lowest temperature we have ever been able to record after 20 to 30 minutes time of having the thermometer in the carton was 10° F., and it goes from there up to 28° F. And placing packages at 18° F. in the freezer in direct blast took six hours to get down to zero.

"We do buy a few frozen foods specialties from two frozen foods jobbers. The first one we checked was the Gordon Van. With a blanket of dry ice over the frozen foods and on one of our very hot days, the temperature was at a level which I just do not dare mention.

"On Sept. 1 we tested delivery from the oldest frozen foods jobber in western Michigan, who has his own warehouse and trucks and who, a few years ago, was very critical of my report at a frozen foods meeting and suggested I buy merchandise from a concern that knew how to handle the product.

"We received that shipment on Sept. 1 at 7:30 a.m. Our store was the first stop. The driver had been on the road for about an hour. When we checked, the temperature in the truck was 18° F. Two items checked as above showed 18° F. and 25° F. A week later we tested with the same results.

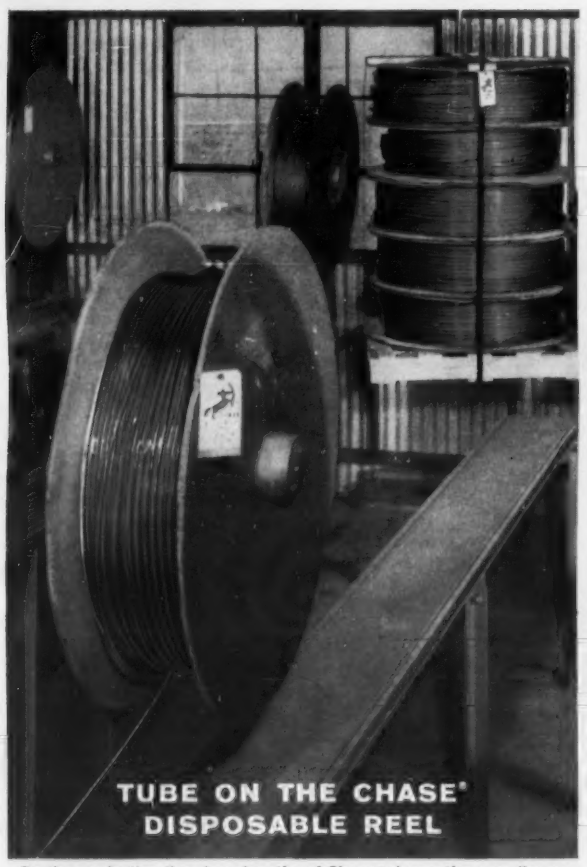
"With all these tests and similar results from practically every retailer reporting, it would appear that under the code of zero or below temperatures at all times, no retailers could accept any frozen foods delivered to them.

"We received an ice cream delivery in heavily insulated trucks, and the temperature in those trucks was 5° F. This would put us out of the ice cream business.

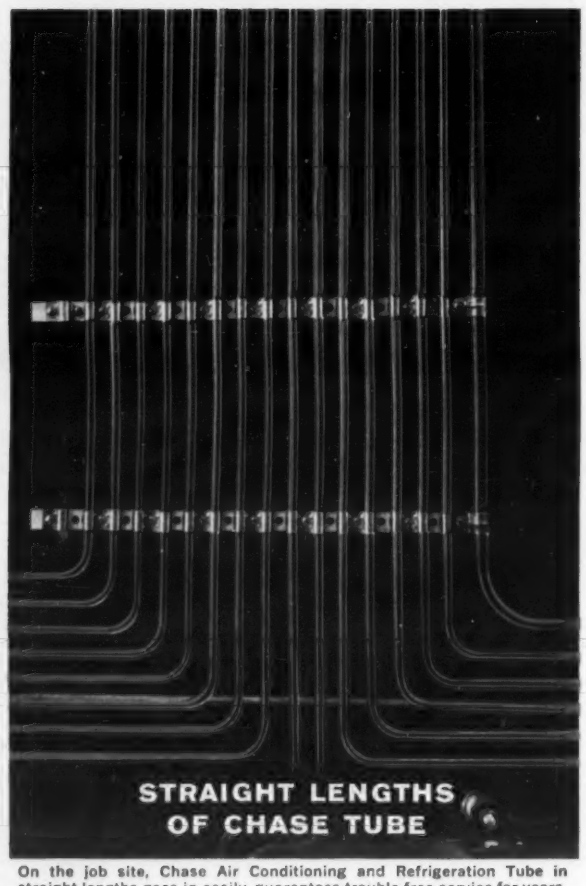
"I think retailers have to ask themselves another question. That is, are frozen foods so profitable to handle that we can go to the extremes of buying new equipment, doing complete rewiring jobs to bring in heavier loads of electricity, and still be faced with penalties such as must be set up in either a voluntary code or legislation requiring zero temperatures or below? Let's look at the record!

"How much are we really


# What'll you have?




On the production line, long lengths of Chase tube on the new disposable reel speed up output, cut down wastage, save costs. Ask for details.




On the job site, Chase Air Conditioning and Refrigeration Tube in straight lengths goes in easily, guarantees trouble-free service for years.

**YOU CAN GET** Chase® Air Conditioning and Refrigeration Tube in the form that best matches your needs. Order in 50 or 100 ft. coils in packages, in straight lengths, with or without end caps, or in extra long lengths on the new Chase disposable reel. If you're not already familiar with the new reel pack, ask your Chase representative for detailed information. He'll show you how the reel permits the use of long, continuous coils and makes definite savings in scrap elimination, inventory control and inventory reduction... *all at no added cost to you.*

And remember—either way you buy—Chase Air Conditioning and Refrigeration Tube is your assurance of quality that protects your good name. Talk over your needs for straight tube or reel pack with Chase today—locally or at Waterbury 20, Connecticut.

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making in frozen food departments? At our store, with an investment in freezers, display cases, compressors, etc., of approximately $30,000, we have come up with some shocking figures.

"I have here a weekly report on frozen food operations. Incidentally, frozen foods represent 4.11% of total sales, and ice cream is 4.66%, or a total of 8.77% of the total sales of the store in frozen items.

"During that week we purchased 225 cases of frozen foods which were sold at a gross markup of 20.3%, and 1,517 gals. of ice cream sold at a gross of 6.5%. This ice cream gross is low, but we used ice cream as a leader during the hot weather.

"Time study tests made on handling frozen foods shows labor costs of 6 cents per case (that is direct labor) and 1 cent per gallon on ice cream.

"Allocating expenses on the basis of power, water, and maintenance actually used for the frozen food equipment, rental on the basis of amount of floor space used, and other general expenses, including administrative, on the basis of 8.77% (frozen foods in relation to total sales) we come up with purchases of $2,335.23 sold at $2,682.46 or a gross profit of $347.23.

"Against that there is total expense of $470.53 or a net loss of $123.30 per week.

"Although I have suspected we were not making much money in frozen foods, and this test certainly proves it, it points up the need for more ingenuity on our part to make the department pay its way and contribute something to general store income.

### Cooperation Sought

"In other words, we must meet the challenge and the producers, transportation agencies, and distributors must assist all retailers in this very important project. We must not try to find fault with one another, do any finger, pointing at all, but rather all work together so this important product can be delivered to consumers in a shorter period of time, at or below zero temperatures, to maintain quality, taste, and health value.

"Consumers, too, must become temperature conscious so they will handle the product properly after they take possession again to maintain health value, quality, and taste.

"Once more, to processors, transporation agencies, and distributors, as well as all others interested in frozen foods, let me say that we need more knowledge, improved research, and then a really effective educational program at all levels, including consumers.

"The team has to include equipment manufacturers—and we probably will need improved refrigerants, better engineering, improved maintenance, and, above all, complete understanding and cooperation all along the line. There is also great need for a new concept of the perishability of frozen foods!!

"With a determined 'working together,' we can offer Mrs. American Consumer top quality products to please the palates of everyone and at a profit to all concerned."

## Grocer's Figures Cast Doubt On Heavier Investment In Refrigeration

| | Purchases | Sales | Gross Profit | Gross Rate % |
|---|---|---|---|---|
| Frozen foods (225 cases) | $1.101.65 | $1,256.07 | $254.42 | 20.3 |
| Ice cream (1,517 gals.) | 1,333.58 | 1,426.39 | 92.81 | 6.5 |
| Totals | 2,435.23 | 2,682.46 | 347.23 | 12.94 |

Store Sales — $30,586.77 — Frozen Foods is 4.11%; Ice Cream is 4.66%; 8.77%

| EXPENSES | | | |
|---|---|---|---|
| Direct labor 6¢ per case frozen | | | $13.50 |
| Direct labor 1¢ per gallon ice cream | | | 15.17 |
| General Wages | | | 42.41 |
| Advertising | | | 34.25 |
| Maintenance — Store | | 6.98 | |
| Electric | | .81 | |
| Plumber | | .30 | |
| Refrigeration | | 7.82 | 15.91 |
| Auto-Truck expense | | | 1.69 |
| Laundry | | | 2.69 |
| Miscellaneous | | | .91 |
| Trading Stamps | | | 63.49 |
| Store Supplies | | | 19.53 |
| Utilities — Power | | 46.69 | |
| Water | | 26.54 | |
| Telephone | | .88 | |
| Gas | | .84 | 74.95 |
| Depreciation on Equipment | | | 57.69 |
| Insurance and Taxes | | | 25.98 |
| Rent | | | 33.74 |
| Administrative Expense: | | | |
| General | | 8.87 | |
| Salaries | | 59.48 | 68.35 |
| Total Expenses | | | $470.53 |
| Net Loss | | | $123.30 |

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# The 5-Year Warranty

## *An Independent Wholesaler Tells What He Would Like To See In the Way of Manufacturer and Wholesaler Warranties*

***By E. L. Tramposh,***
***Refrigeration Equipment Co., Kansas City, Mo.***

The 5-year warranty on refrigeration compressors and the refrigeration cycle has been the subject of much discussion during the past year, particularly by those in the field who have the task of making the warranties good in the field.

The attitude of the independent air conditioning and refrigeration supplies wholesaler on this subject was set forth recently by E. L. Tramposh, Refrigeration Equipment Co., Kansas City, and a past president of the Air-Conditioning & Refrigeration Wholesalers. His comments appeared originally in the *ARW Journal,* and are published with permission.

There has been much criticism of the five-year warranties on compressors. A great deal of it is justified. Among other abuses are the following:

1. Too many warranties have been issued by manufacturers requiring replacement by the factory. This caused delay in getting the equipment back in operation, resulting in loss of use and in many cases, loss of valuable products or merchandise. Manufacturers attempted to save money by making the replacements themselves, rather than having them made through wholesalers, disregarding the interest of their customers.

2. Too many manufacturers are "carrying their own insurance." Many of them have gone broke or become involved in financial difficulties with the result that the warranties are absolutely worthless. This includes some of the largest manufacturers in the business.

People paid good money for the warranties and are certainly entitled to the protection that five-year warranties should afford. We believe that many small and weak concerns inadequately financed and generally irresponsible have issued five-year warranties—either giving them away or charging good money for them without serious intention of making good on those warranties. Many firms have closed out their business, changed their names or moved to other locations and, therefore, can't be found when the time comes to make replacements on their warranties.

3. Many manufacturers have expected the dealers and service people to make replacements through authorized refrigeration wholesalers without allowing the wholesaler enough money to cover the transaction. The wholesaler is expected to make the sale at a reduced price, even at a loss when the cost of doing business is considered.

In many cases, the wholesaler is expected to make the in-warranty replacement without profit and even without recovering his actual cost. After the first year, often the manufacturer will attempt to make the exchanges directly, ignoring the wholesaler completely.

These and many other abuses have brought the five-year compressor warranties into disrepute and ill favor. However, the public has come to accept the five-year warranties and will continue to buy them as long as they can be secured. Whatever we may personally think of five-year warranties or feel about them, we will have them for many years to come.

What would we as wholesalers like to have in the way of five-year warranties?

### What He Would Like In Mfr. Warranties

So far as warranties issued by manufacturers may be concerned, among other things we would like:

1. All warranties should be insured in an established, well recognized insurance company—rated not less than A+ by Alfred M. Best & Co. The insurance policy should cover the interest of the "Ultimate Purchase-User" regardless of what might happen to the manufacturer, wholesaler, dealer, or anybody else.

2. Even though the manufacturer retires from business, goes broke, sells out, is placed into the hands of trustees or whatever else may happen to him, the insurance company would pay for replacements made under the warranties.

3. All warranties should provide for the exchange or replacement of compressors through authorized refrigeration wholesalers. Public interest and needs can only be properly serviced through wholesaler replacement — both in-warranty and out-of-warranty.

4. While the wholesaler's remuneration on in-warranty replacements is governed and controlled by the allowance of the compressor manufacturer within the first year warranty, on all out-of-warranty replacements the wholesaler should, in all cases receive his regular selling price and not be expected to take any discounts.

5. If it were possible, we would like to have these warranties so set up that we would have absolute assurance that the manufacturer would pay us for the out-of-warranty replacements. These replacements should be paid promptly upon receipt of our invoices and simple proof of loss forms.

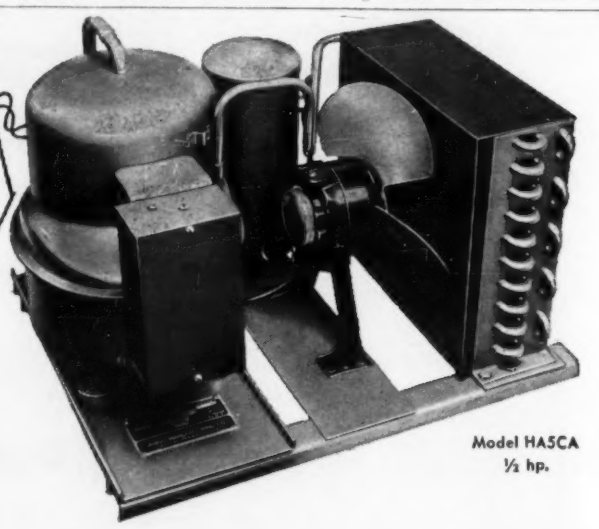
### Wholesaler Warranty Program Outlined

So much for warranties issued by manufacturers or other people. Many of our wholesalers have warranty programs of their own and will probably continue them. Just what kind of a warranty program would do the best possible job for us?

*A Good Warranty Program*

Where warranties are issued in our name and become therefore our responsibility, we want an insurance policy that will protect us for all the liability

for heavy duty—
PLENTY TOUGH



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Model HA3CA
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which we have under these warranties. This policy should provide protection to our customers regardless of what might happen to us, to our dealers, to warranty organizations or to insurance agents or brokers. The coverage should run directly to the owner and is non-cancelable, once it is issued.

### Wholesaler Should Be Reimbursed for All Costs

Since the administering and handling of any warranty program costs money we should be reimbursed to cover our expenses and overhead cost for handling these warranties, in addition to the authorized price to dealers for out-of-warranty replacements.

A desirable warranty plan calls for all replacements to be made through our own stores wherever possible except on compressors that are installed in other parts of the country where replacements may be made through other wholesalers as authorized by us, and the insurance company reimburses us for our overhead expenses in addition to the cost of replacement through another wholesaler.

The warranties issued in our name covering a five-year period should have a definite limit so far as our liability is concerned. No one has any business warranting a compressor for five years with a definite limitation of liability because of the threat and very real danger of future price increases. Along with this, the insurance coverage should protect us on all liability which we have under these warranties.

Because the manufacturers limit their one-year warranties to one year of installed life or from 15 to 24 months from the time the compressor is manufactured—depending upon the particular factory, a desirable warranty plan should provide for insuring any liability that we might have on compressors that are out of factory warranty or which will be out of factory warranty before the full 12 months from date of installation has run its course.

### 5-Yr. Warranties Should Be Issued by Wholesaler

On equipment which we sell, the 5-year warranties should be issued by the wholesalers. The dealers know where to go for replacements; know how the warranties are handled; don't have to put out their money for exchange units and then wait to be reimbursed; and can personally discuss any problems that may arise directly with the wholesaler.

Full responsibility for the warranties is vested in the wholesaler whose prosperity—even existence—is dependent upon the service he gives. All warranties are insured, directly covering the owner of the warranted unit.

The wholesaler buys the insurance and pays for it. The program is HIS program. In case the wholesaler discontinues a line of compressors, repairs or replacements under the warranties will be made by the wholesaler who sold the equipment and issued the warranties. Replacement business will not be turned over to some other wholesaler as would happen where the compressor manufacturer issues the warranties.

The insurance coverage should be sufficient to enable the wholesaler to make replacements with another brand of compressors or to secure replacements of the same brand from another wholesaler, making a satisfactory profit in either case. Since there are many changes in lines, it is most important that the wholesaler protects both his business and his customers by having a good, 5-year warranty of his own.

There are, no doubt, many other requirements for a desirable 5-year warranty program. What we wholesalers want is a program that will fully protect the public and will pay for the repair or replacement of a defective compressor and at the same time will adequately compensate and reimburse us for the full list price of out-of-warranty replacements, plus a reasonable amount for administering the Warranty Program.

## Region 9 ARW Members, Families Met at Disneyland But Fathers Attended Meetings

COLUMBUS, Ohio — Disneyland was the site of the fall meeting of Region 9, Air-Conditioning & Refrigeration Wholesalers, held Oct. 2-4.

Region 9 members are from Utah, Arizona, California, and Nevada.

"When we selected Disneyland as our meeting location, we decided to make it for kids of all ages," stated Chairman Robert Shaw. "For the first time we invited the members' children to join with us. While each member was attending business meetings—the families were enjoying the fabulous sights of Disneyland."

A joint meeting of manufacturer suppliers and wholesalers brought out discussion on mutual problems and better ways to serve the trade. Two major topics discussed were: "Direct Selling by Segments of Manufacturers in the Industrial and Air Conditioning Field" and "Air Conditioning Installation Improperly Engineered or Installed."

Elected to serve as officers for 1960 were William Davidson Hinshaw Supply Co., San Francisco, as chairman and A. G. Pond, A. G. Pond Co., San Jose, as secretary-treasurer. W. C. Miessemer, Arizona Refrigeration Supply, Phoenix, continues as Region 9 Director in ARW National.

## PPG's Fiber Glass Div. Names James C. Plunkett Advertising Manager

PITTSBURGH — Due to expanding markets and operations of the Pittsburgh Plate Glass Co.'s Fiber Glass Div., the appointment of James C. Plunkett as full-time advertising manager has been announced by Michael J. Batenburg, director of information services.

Prior to his appointment, Plunkett had served since 1951 as manager of advertising for Columbia - Southern Chemical Corp., wholly-owned subsidiary of Pittsburgh Plate, and also for the Fiber Glass Div. which was activated that year.

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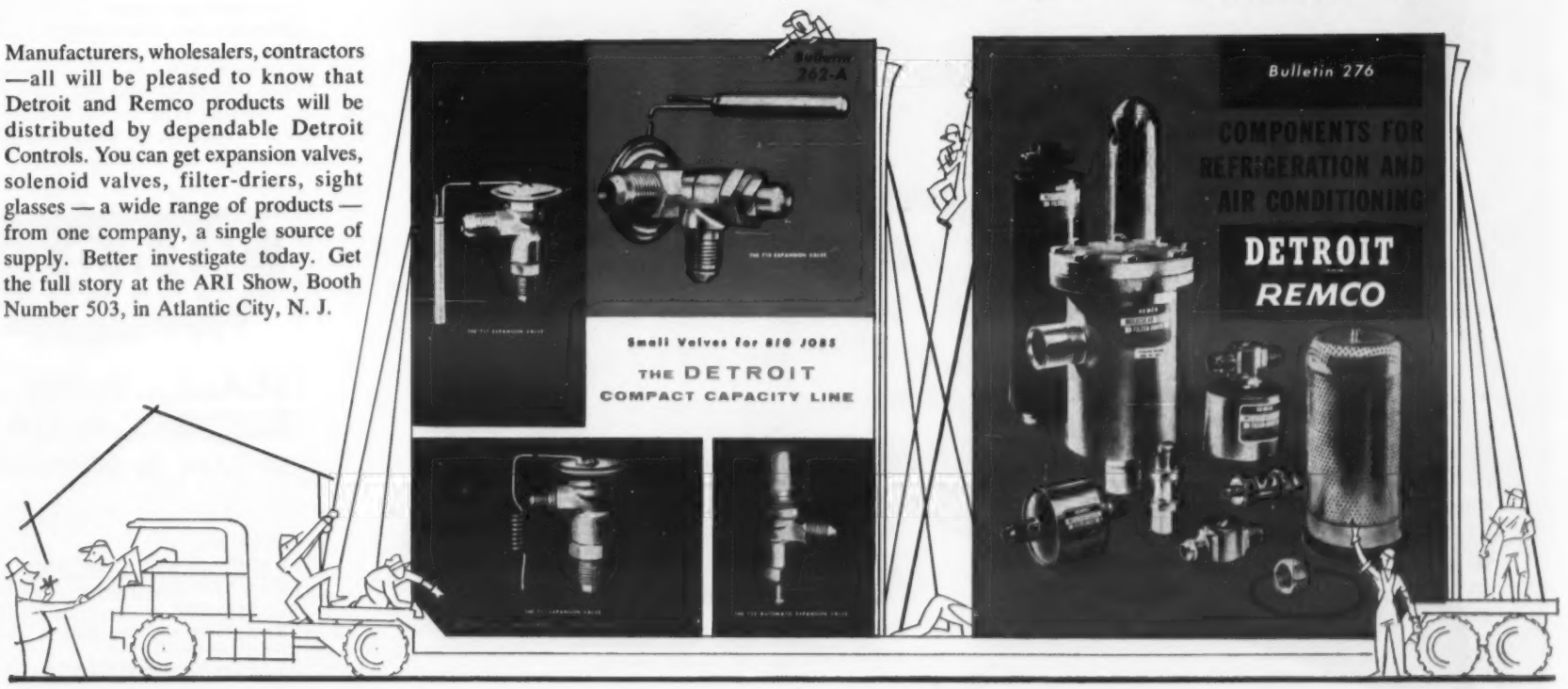


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DETROIT CONTROLS DIVISION

# Halstead & Mitchell Building New Plant

PITTSBURGH — In a major move to expand facilities for non-ferrous metal fabrication, Halstead & Mitchell here has broken ground for a new plant which will increase its output by 150%.

The new construction will add 180,000 sq. ft. to the 135,000 sq. ft. the company now has under roof at the Zelienople, Pa. plant site, according to Byron Halstead, senior partner.

The ultramodern plant will be operated by the company's Herbie-Duke Div. A windowless structure, it will be completely air conditioned, with lighting to 40 ft.-candles throughout.

The new building will be 300 ft. by 600 ft. in floor plan, and will stand 32 ft. high. A modular structure, it will contain six 50-ft. bays across its 300-ft. width, and 12 50-ft. bays in its 600-ft. length. It will be served completely by overhead crane.

BYRON HALSTEAD, senior partner, Halstead & Mitchell, inspects water-cooled condensers which will be manufactured from copper to be produced by his company's vastly expanded facilities for non-ferrous metal fabrication.

Output of the expansion is intended to increase Halstead & Mitchell products for the refrigeration and air conditioning industries, including a major increase in facilities to produce non-ferrous metal fabrication for other manufacturers. The plant is designed to be a completely integrated basic metal working facility.

When completed and tooled, this Halstead & Mitchell expansion will provide an additional 300 jobs. First segment of the plant is scheduled to be in production by late January, 1960, if there are no unforeseen delays.

Halstead & Mitchell products include cooling towers, water-cooled and air-cooled condensers, and "Turbo-Flo" finned surface.

## *Balogh Appointed KMP Chief Engineer, To Develop Products*

LYONS, N. Y.—Stephen Balogh has been appointed chief engineer at Kenmore Machine Products, Inc., here, James A. Smith, president, announced.

S. Balogh

Balogh will be responsible for new product development in cooperation with sales management and field requirements.

For 12 years prior to joining Kenmore Machine Products, Balogh was employed by General Electric Co. as an engineer in the household refrigerator department where he served in a number of capacities.

## Quincy Products Adds 20,000 Sq. Ft. Of Production Area

QUINCY, Mich. — Expansion of production facilities at the Quincy Products Co. was announced by M. Stubnitz, president of Stubnitz Greene Corp.

The Quincy firm is a division of Stubnitz Greene, which maintains offices in Adrian.

Manufacturer of coils, condensers, and other heat transfer equipment, the Quincy firm is a major supplier to the refrigeration and air conditioning industry, it was noted.

Plant expansion includes the addition of 20,000 sq. ft. of production space. Because of the firm's production techniques, which include the in-plant forming of all serpentine, large stocks of raw materials are kept in the factory, the announcement said.

According to Stubnitz, "the expansion program for the Quincy operation is the first in several planned steps to equip the firm for peak production."

As well as increased plant area, a new administrative wing is under construction at the Quincy site. To house all executive and sales offices, the building will join the plant through a series of entries which will lead directly to specific operational areas of the plant.

J. R. Neal is plant manager of the firm.

## G-E Bulletin Describes M-60 Leak Detector

SCHENECTADY, N. Y. — Availability of a new 12-page bulletin (GEZ-2939) on its M-60 mass spectrometer leak detector has been announced by General Electric Co., Schenectady 5, N. Y.

The bulletin describes operating principles, features, and application data of the detector for locating leaks in vacuum and pressure systems.

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OF CAST IRON AND STEEL
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2 to 3 tons—Refrigerant 12
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• rapid shifting—to shorten change-over time and therefore shorten defrost cycle.
• the shifting of the valve independent of any pressure drops, and efficient shifting under any combination of operating conditions.
• mounting in any position—except with the pilot valve upside down.

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# Radar Tower Conditioner Units Must Be Foolproof

## *Systems Built to Resist Corrosion, Fungus, Breakdowns Cool Vital Detection Centers*

SYRACUSE, N. Y. — What are described as two of the most rugged cooling systems ever built as packaged units have been developed by Carrier Corp. for use in radar towers.

"Because of extreme demands made upon them, their operation is virtually fool-proof," according to Charles V. Fenn, vice president of the Machinery & Systems Div.

The units are being built under a government contract awarded to General Electric Co. They were designed in conjunction with that firm's Heavy Military Electronics Department and the U. S. Air Force Air Research and Development Command's, Rome Air Development Center, Rome, N. Y.

The coolers must work equally as well in the tropics as in salt water atmospheres or arctic regions, it was pointed out. The must be sturdy enough to be parachuted to earth from a cargo plane. For ease of operation, both units are air cooled and ready to function when supplied electric power.

### 'Reserve' Unit Comes In If Failure Occurs

Because the cool air or liquid they provide is essential, each model has three complete systems. One, two, or all three can operate at one time. A reserve system is automatically turned on in event of trouble, and the fault is indicated on a panel of coded lights.

Electronic equipment towers containing sensitive electronic gear for detecting, tracing, and identifying missiles or enemy aircraft are generally located in remote areas. To compensate for lack of experienced maintenance help, key parts are corrosion and fungus resistant.

### Faults Diagnosed by Electronic System

However, an elaborate electrical control system enables the units to diagnose their own troubles. Actual repairs are made by electronics technicians with the aid of an instruction manual.

"Whether outside temperature is 30° below or 125° above zero, 'washing' the heat-emitting electronic apparatus with cool, dry air or liquid is required," Fenn said.

In each radome there are three packaged air conditioning units and two air-cooled refrigeration plants. Sturdy components for both are encased in boxes approximately the size of an 8-ft. hallway and framed with 1½-angle iron.

### Packaged Units for Air, Glycol Systems

The air conditioners have a cooling capacity of 15 tons. Three separate refrigeration circuits using 7½-hp. hermetic reciprocating compressors are located in the bottom of each unit. Discharge velocity of conditioned air directed into the space or lead-off ductwork is 450 f.p.m. The volume of condensing air is 11,000 c.f.m.

The packaged cooler uses similar refrigeration systems. Glycol is the coolant circulating through small passages in the electronic devices next to closely integrated heat-producing sources, such as vacuum tubes and banks of tiny electrical switchgear.

Built to meet Air Force specifications, they have more than enough durability for installation in factories, Fenn said. They are also suitable for mines, oil drilling, or any nomad operation calling for equipment that can "take a beating," he added.

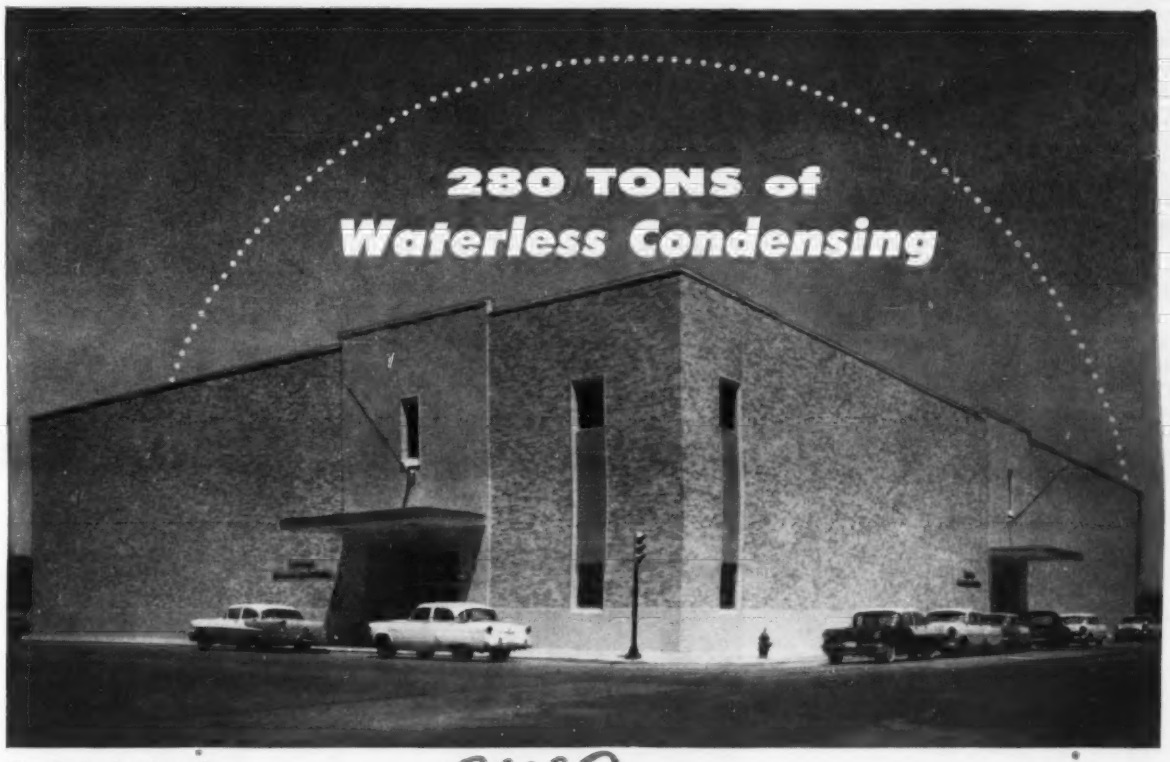
At right, test engineers check packaged refrigeration unit which removes heat from closely integrated banks of electronic tubes and tiny electrical switches in U. S. Air Force radar system by piping Glycol alongside "hot spots." Cabinet at left houses one of three air conditioning systems developed by Carrier to maintain constant operating temperatures in the radar tower.

## Danfoss, Denmark Mfr., To Produce in Canada

TORONTO, Ont., Can.—Danfoss Mfg. Co., subsidiary of Danfoss Mfg. Co. of Nordborg, Denmark, plans to manufacture automatic equipment, including thermostatic controls and valves, for the refrigeration, heating, and electric industries in a plant on a four-acre site it has acquired at Lake Shore and Dixie Rds., according to the Toronto Industrial Commission.

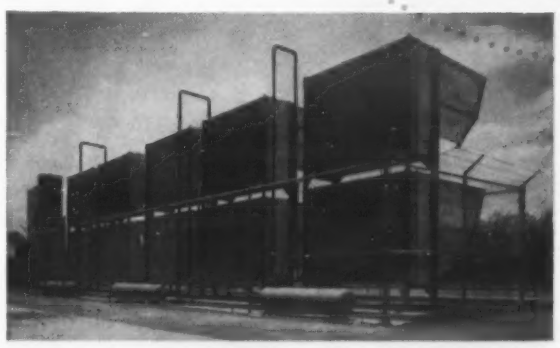
A 10,000-sq. ft. plant and head office is scheduled to be completed in February. Ultimate size will be 80,000 sq. ft.

The company has maintained a sales office in Toronto for seven years. The parent firm employs 4,000 people and is represented in 73 countries with branch plants in four of them. B. T. Nielson is manager.


The Avalanche Journal Building, Lubbock, Texas. W. A. McMillan, Architects; Hedrick and Stanley, Engineers; Anthony Co., Mechanical Contractors.

with McQuay AIRCONS
for this
Texas Newspaper Plant



Remote McQuay horizontal air flow Aircon installation with wind deflectors at Avalanche Journal Building, Lubbock, Texas.

In Lubbock, Texas, where the weather is both hot and dry, and water is a problem, this bank of 10 McQuay Aircons furnishes 280 tons of refrigerant condensing for the new plant of the Avalanche Journal.

Engineers and architects like McQuay Aircons because of their flexibility and their operating and installation economy. McQuay Aircons are made in 8 models from 7½ to 75 tons capacity in a single unit in either vertical or horizontal air flow models. Unlimited capacity is available in multiple unit installations.

You not only get more models and more capacity, you get more performance, because McQuay Aircons have the exclusive McQuay Ripple-Fin coils—the finest and the standard of the industry.

The McQuay "Seasontrols", automatic head pressure controls, are available as accessories, and modulate the condenser capacity in accordance with the weather for proper operation at all times. For complete information, call the McQuay representative in or near your city, or write McQuay, Inc., 1607 Broadway Street N.E., Minneapolis 13, Minnesota.

McQuay INC.
AIR CONDITIONING • HEATING • REFRIGERATION

McQuay Means Quality

# Fundamentals of Air-Moving Systems

## (4) How Orifices Affect Fan Performance

*By L. C. Lindstrom,*
*Air Impeller Div., The Torrington Mfg. Co.*

In the last three articles in this series (AH&RN, Aug. 17, 24, 31) the effects of changes in wheel housings were described in terms of performance tests on particular blower units. Because fans are equally important to engineers and contractors who specify and install air-moving systems, this article will demonstrate—also by showing actual test results—how the shape, size, and location of orifices can influence the performance of propeller fans.

### FUNCTION OF ORIFICES

The propeller fan (Fig. 1) moves air from one space into another by creating a difference in air pressure between the two spaces. The intake and discharge sides of a propeller fan are by definition separated by a wall so that all air flow between the spaces passes through the orifice which surrounds the fan blades. Free-air fan (or room circulators) which may or may not have orifices and which do not have a dividing wall, are not considered in this article because fan performance is altered a great deal by the relatively short return air path between the fan discharge and intake.

As with a blower wheel, the performance of a propeller fan may be expressed in terms of the air flow rate and difference in static pressures at discharge and intake for a given rotating speed. Power input and static efficiency, which gives the percentage of electrical power input that is converted to air power, are also important characteristics of propeller fans.

Performance figures on propeller fans in impeller manufacturers' literature are based on tests using orifices of specified types and dimensions. The recommended orifices and installed positions permit the best possible air-moving performance in applications for which the fan is designed. Of course, structural considerations in the unit design may be such that it is necessary to change the type or dimensions of the orifice, even at the sacrifice of peak fan operation.

### TYPES OF ORIFICES

The three most common types of orifices for enclosing propeller fans are shown in Fig. 1, (1) sharp edge, (2) cylindrical, and (3) bell mouth. The sharp-edge orifice is a circular opening in the plate or walls separating the intake and discharge sides. The cylindrical orifice is simply a very short section of duct which partially encloses the propeller fan. The length of the duct varies, although there is very little reason for a cylindrical orifice that extends beyond the intake edge of the impeller blades. The bell-mouth orifice is considered a converging device in that the cross-sectional area of intake air flow is gradually decreased by the smooth bell curvature. The rim of a bell-mouth orifice normally consists of a 90° curve of constant radius R.

Most of the axial depth of the fan blades project through a sharp-edge orifice on the intake side (Fig. 1), while the fan blades are mostly within the orifice itself in the other two types. Only a small part of the axial depth of the fan blades sticks out on the discharge side of all three orifice types.

### HOW ORIFICES AFFECT PERFORMANCE

Operation of a propeller fan is influenced by the design, size, or location of an orifice in four ways: (1) clearance between fan blade tips and orifice, (2) axial depth of orifice, (3) position of fan in the orifice, and (4) type of orifice. Each of these factors is under the control of the engineer who specifies air-moving components in an air conditioning or refrigeration system. The contractor who installs air-moving systems, handles maintenance and perhaps remodels existing systems should know how important each of these orifice characteristics is in operation of the over-all system.

The gap between the blade tips and the orifice allows the leakage of air from the high-

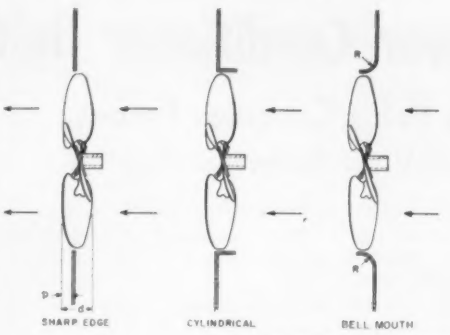



FIGURE 1

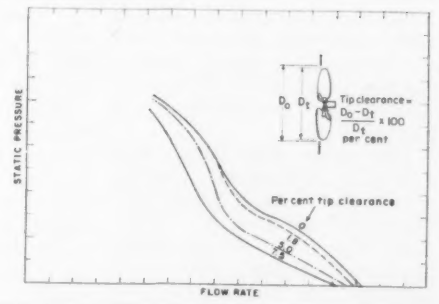
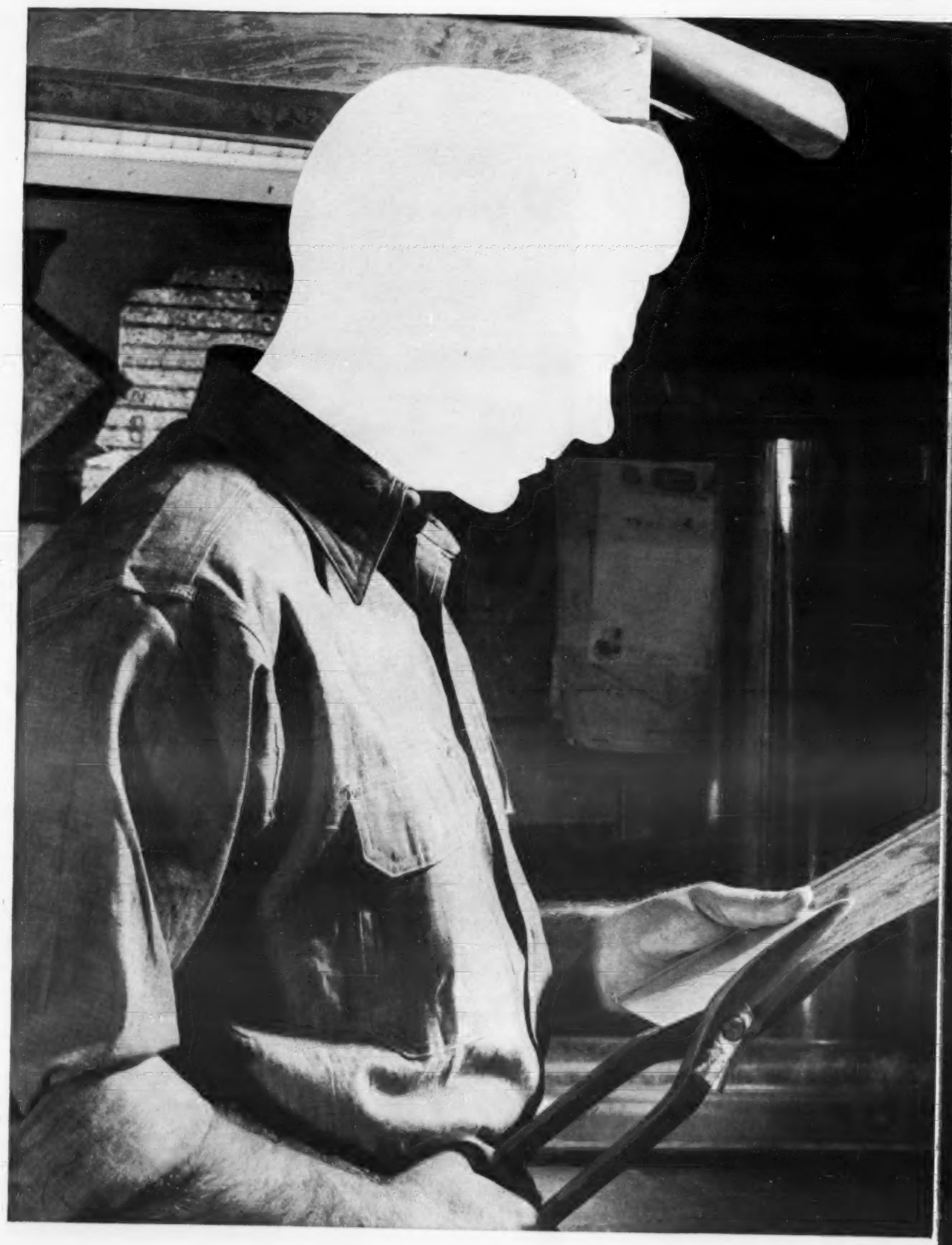



FIGURE 2



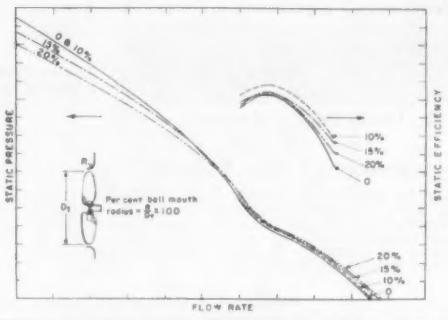



FIGURE 3

pressure discharge side of the propeller fan back to the low-pressure intake side of the fan. When the tip clearance is larger, the leakage is greater and the flow rate is smaller for particular pressure differential between discharge and intake.

To obtain the maximum flow rate, it is then necessary to minimize tip clearance so as to eliminate as much air leakage as possible. A tip clearance of 1.5 to 2.0% of fan diameter (as defined in the drawing in Fig. 2) produces impeller performance very nearly equal to that for zero tip clearance and yet the orifice can be produced with normal commercial tolerances.

In Fig. 2 performance tests have been made on a particular propeller fan operating at the same speed in four different sharp-edge orifices with tip clearances of 0, 1.8, 5.0, and 7.5%. Note that there is very little difference in the pressure curves for zero and 1.8% tip clearance.

The effect of tip clearance is smaller at high static pressures because the higher radial air velocities produced by the increased resistance to flow tend to seal the clearance gaps and thereby reduce air leakage.

## AXIAL DEPTH OF ORIFICE

Variation in the axial depth of an orifice is most important in the bell-mouth type. A sharp-edge orifice has virtually no axial depth anyway. There is a negligible change in impeller performance for cylindrical orifices that extend slightly beyond the intake side of the impeller blades. Of course, if the orifice or duct enclosing the impeller is too long, the flow output would drop.

A cylindrical orifice which is so short that the blades project more than about 30% through the intake side of the orifice is virtually a sharp-edge type and does not add any of the flow smoothing that can be obtained in the cylindrical form. Because the original cost and space occupied by the propeller fan are reduced by minimizing the axial depth and duct material, it is common practice to set the intake sides of the cylindrical orifice flush with the impeller blades. The performance of a propeller fan in a cylindrical orifice can be somewhat improved by adding a bell mouth to the intake side to provide more uniform flow direction.

The axial depth of a 90° bell-mouth orifice is of course equal to its radius R (Fig. 3). The pressure-flow curves in Fig. 3 show the effects of a bell-mouth orifices with values of R that are zero, 10, 15, and 20% of the blade-tip diameter (a bell-mouth radius of zero per cent becomes a sharp-edge orifice). The corresponding curves for static efficiency in the usual range of operation of propeller fans are also given.

The propeller fan with any of the three bell-mouth orifice sizes delivers a given flow rate against higher static pressures than with the sharp-edge orifice in the range of higher flow rates, but the improvement is relatively small. However, the static-efficiency curves show that the 10% bell mouth is substantially more efficient than the sharp-edge (or zero per cent) type or the larger bell mouths of 15 and 20% curvature. The 5 to 10% higher static efficiency, depending on the location of the operating point, is almost always worth the trouble of specifying the proper bell-mouth orifice size.

A bell-mouth radius of 10% is recommended. Above this figure, the axial depth gets unnecessarily large since there is negligible improvement in performance with the larger orifice sizes. Below 10%, the flow-smoothing effect of the orifice curvature is reduced, resulting in the lower static efficiency.

*(To Be Continued)*

## R. A. Halla Licensed As Engineer In 3rd State

YORK, Pa.—Robert A. Halla, manager of the marketing services department of York Div., Borg-Warner Corp., has been licensed to practice professional engineering in the state of New York.

This is the third state to grant a professional license to Halla.

## *Miamians Dream of Air Conditioned City*

MIAMI, Fla.—Will Miami become an air conditioned city? City officials and members of the Metro commission are said to be optimistic over just such a possibility.

Recently they took the first step in setting up a so-called 25-year timetable for turning Miami into what they described as "a Magic City Center that someday may be glassed-in and air conditioned."

City and county planners and civic leaders are cooperating in a survey of around 4,000 downtown business houses in what is described as the first phase of creating a comprehensive plan for the long-haul development.


The man who had to become an executive while using a pair of tin snips

Finger callouses once marked the successful man in your field. Not so any more. The heating and air conditioning business "grew up" almost overnight.

Suddenly you had to be many other things besides a master mechanic. You had to be a merchandiser, purchasing agent, cost accountant, public relations expert, sales developer—and assume a role of leadership in the community.

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**They'll Do It Every Time**

by

Jimmy Hatlo

LOOK AT HOW EASY THEY TAKE IT---HA-HA-SLOW MOTION-
AN' GET A LOAD OF THE SIDEWALK SUPER-INTENDENTS---THEY STAND THERE ALL DAY....
YEAH---THAT ONE GUY IN THE SHINY HELMET KEEPS LOOKING OVER HERE, WAVING AT THE GIRLS IN THE ACCOUNTING DEPARTMENT-
LISTEN TO WHO'S TALKING--- SINCE THAT BUILDING STARTED TO GO UP THEY'VE BEEN AT THAT WINDOW FROM 9 TO 5....
THEY SURE ARE GLUED TO THAT SPOT---THEY ONLY TOOK TWO COFFEE BREAKS SO FAR THIS MORNING---
HERE COMES BIGCOME. HE'LL PUT 'EM ALL OUT IN THE STREET WHERE THEY CAN GET A GOOD LOOK---
8-25
WATCHING THE OFFICE BIRD WATCHERS DO THEIR STUFF ON THE COMPANY'S TIME....
THANX AND TODAY OUR HAT IS OFF TO MARION BRADY, OMAHA LODGE, MOUNTAIN HOME, PA.
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# 'Engagement Rings' Are Beautiful— But Will He Really Marry You?

*(Concluded from page 1)*

When inaugurated, the ARI deal on heat pumps should provide (as does the unitary "honest measurement" air conditioner program) the following actions:

***Testing and rating*** by manufacturers, reporting these findings to ARI, publication of results, random examination of units on the market by an independent laboratory under contract to ARI, and special rigors and rizors on particular units about which complaints have been lodged.

Participating companies will sign contracts with ARI agreeing to these procedures, and will be authorized to use the ARI Seal of Certification on unitary heat pumps so long as they comply with the touchstone code and its practical application.

Sounds good. All the way the intent is good, too. All according to plan. All according to Hoyle.

But will it really work out in practice?

Will manufacturers truly comply with these Honest Ratings, or will some of them weasel?

Will all dealers and contractors keep their local newspaper advertising, and their verbal promises, within respectable bounds of the compliance formula?

***Many hard-nosed subscribers*** of this newspaper are worried about these questions. Example:

Russell Gray, Carrier vice president, perhaps worked harder than anybody else you can name in *getting down to cases* to prepare those standards, recognizances, etc., which comprise the ARI Certification Program.

Sensibly he is worried about the ultimate destiny of his expensive planning endeavors. Nor is he alone in this concern for the future of certification. Will lip-service cause it to be difficult to administer, or cause it to fail?

Nobody can be sure—unless and until a favorable reading is taken of our industry's *attitude toward honesty itself*.

Months of harrowing committee work, weeks of diplomacy on the part of *nonpareil* George Jones and his staff (not to mention carefully thought-out NEWS editorial exhortations) could go down the drain if this attitude-appraisal *remains* disappointing.

***IF too many people*** in our industry would rather be *slickers for suckers* than honorable businessmen, we'll be back behind the eight-ball again.

Principal point of this Honest Measurement campaign is promotion of a PRINCIPLE. Which is:

*Customers should not be hoodwinked.*

*"Caveat Emptor"* (let the buyer beware) is for the birds nowadays. *"Caveat Mercator"* (the seller should prove his claims) has replaced it as the guiding principle of better business.

That "public be damned" attitude is what Karl Marx was shooting at in the 19th Century when he framed Communist Theory as a response to Predatory Capitalism.

Both are out-of-date today.

Capitalism has become enlightened humanitarianism. It has converted and converged into what George Romney terms "consumerism" (public opinion deploys the actions of businessmen and ear-to-the-ground politicians).

***Communism, in practice*** has turned out to be retrogression to the Dark Ages (owner-flogging-serfs Syndicalism and Feudalism).

"Honest weights, honest measures" *legally* are an integral part of Twentieth Century Consumerism in America.

Unless and until the air conditioning industry becomes ethical in this regard, it will be rejected—or stunted in its growth—by consumers who enjoy and insist upon Freedom of Choice everywhere around this spinning globe.

Promotion of ARI's Unitary Certification Program will be broadened in 1960 to include "education of the general buying public." That "education of the public" will backfire, however, if the Honest Measurement Program itself is diluted by individual chiselers.

***Many a girl has learned*** to her sorrow that a promise to marry is no guarantee of final wedded status.

Lipservice to a Certification Program (while fudging on it in practice) will be disillusioning, also.

To repeat and conclude: Is the air conditioning industry ready to embrace Honesty itself as a Principle? And thereby become respectable, and profitable at last?

Many, many, many of us have bet our lives and our careers that the answer will be in the affirmative—*eventually*.

But how long, O Lord, how long . . . will it take before these wonderful things arrive?

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Published Every Monday by BUSINESS NEWS PUBLISHING CO., 450 W. Fort St., Detroit 26, Mich. Telephone Woodward 2-0924. Subscription Rates: U. S. and Possessions and Canada: $6.00 per year; 2 years, $9.00; 3 years, $12.00. All other countries: $10 per year. Single copy price, 40 cents. Ten or more copies, 30 cents; 50 or more copies, 20 cents each. Send remittance with order.

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VOLUME 88, NO. 9, SERIAL NO. 1,597, NOVEMBER 2, 1959

## THREE FACTORS LEAD TO LABOR SHORTAGE

John H. and Earl Hunter
Brownsville, Texas

Editor:

In one of your recent issues you had an editorial concerning a shortage of skilled mechanics at present and still greater shortage which will develop in the future. This is a problem that has been worrying the dealers ever since the beginning of World War II.

No doubt, the raising of factory workers' pay due to Union activity and the fact that the manufacturer has been able to sell most any product he could throw together, is the biggest factor in our shortage.

However, the educational factor, in which we demand that every child take a High School education whether he is fitted to it or not, is certainly a big factor in the problem. The policy which is causing a shortage of mechanics is also working to the disadvantage of educational system. The high school curricula has been watered down and weakened both in subject-matter and standards of performance in order to accommodate these educational misfits.

A third factor that enters into the problem is the Defense requirements that takes two of the prime years of a young mechanic's life and returns him to society either married or ready to be married, and he cannot support his family on the apprentice's salary while he learns a trade. On the other hand, he is prime material for the manufacturer's assembly-line which requires nothing more than a good, active physique and the adaptability to work with other people.

The skills involved are distinctly a minor matter; and, in most cases, can be developed in two or three weeks' time. This situation definitely moves raw material to the manufacturer's employment as compared with service employment which is very exacting in its skills and requires a long training period at low earning ability.

JOHN H. HUNTER

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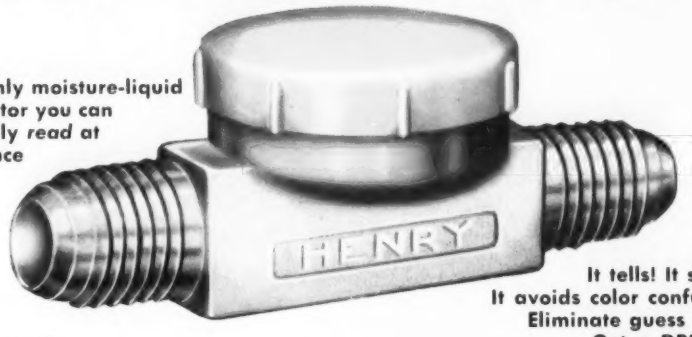


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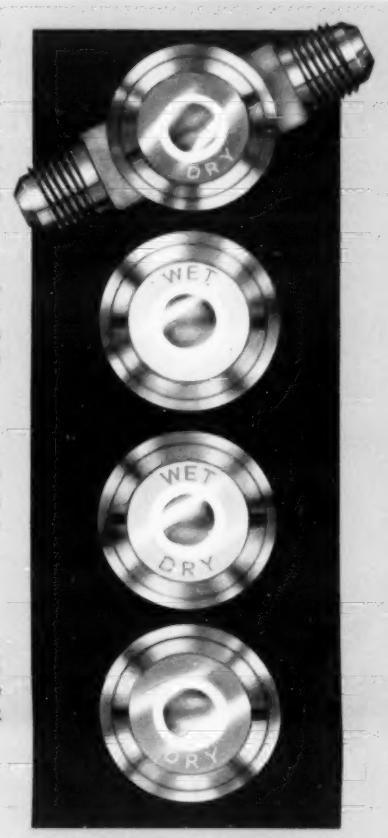
**CAUTION "WET"-"DRY"** As moisture is removed from the refrigerant, the indicator element changes to violet and as the word "WET" fades in contrast, the word "DRY" in pink letters begins to appear.

**SAFE "DRY"** When the moisture in the refrigerant has been reduced to a safe level the indicator element becomes blue and the word "DRY" stands out in contrasting pink letters.

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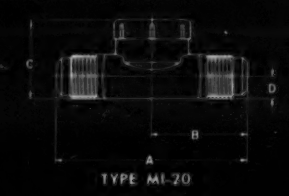


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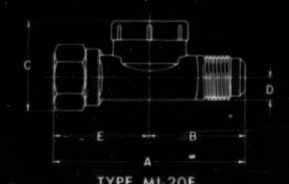


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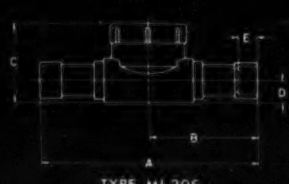


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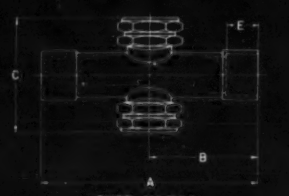


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| Catalog Number | Type Conn. | Dimensions—Inches | | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | |
| MI-20-¼ | ¼" M. FL. | 3 | 1½ | 1½ | ⅜ | — | ⅜ |
| MI-20-⅜ | ⅜" M. FL. | 3¼ | 1⅝ | 1½ | ⅜ | — | ⅝ |
| MI-20-½ | ½" M. FL. | 3½ | 1¾ | 1½ | ⅜ | — | ¾ |
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|---|---|---|---|---|---|---|---|
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| MI-20-¼F | ¼" M. FL. x F. FL. | 2¾ | 1½ | 1⅝ | ⅜ | 1¼ | ⅝ |
| MI-20-⅜F | ⅜" M. FL. x F. FL. | 3⅛ | 1⅝ | 1⅝ | ⅜ | 1½ | ⅝ |
| MI-20-½F | ½" M. FL. x F. FL. | 3⅜ | 1¾ | 1⅞ | ½ | 1⅝ | ¾ |
| MI-20-⅝F | ⅝" M. FL. x F. FL. | 3⅝ | 1⅞ | 1⅞ | ½ | 1¾ | ⅞ |

**O. D. S. COPPER—EXTENDED—FORGED BRASS BODY—SINGLE PORT**

| Catalog Number | Type Conn. | Dimensions—Inches | | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | |
| MI-20-¼S | ¼" O.D.S. | 5¼ | 2⅝ | 1½ | ⅜ | 5/16 | ½ |
| MI-20-⅜S | ⅜" O.D.S. | 5¼ | 2⅝ | 1½ | ⅜ | 7/16 | ½ |
| MI-20-½S | ½" O.D.S. | 6⅛ | 3 1/16 | 1½ | ⅜ | 9/16 | ⅝ |
| MI-20-⅝S | ⅝" O.D.S. | 6⅛ | 3 1/16 | 1½ | ⅜ | 11/16 | ⅝ |
| MI-20-⅞S | ⅞" O.D.S. | 7 | 3½ | 1¾ | ½ | ¾ | ¾ |

**O. D. S. COPPER TUBE—BRASS TRIM—DOUBLE PORT***

| Catalog Number | Type Conn. | Dimensions—Inches | | | | | Wt. Lbs. |
|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | |
| MI-21-⅞S | ⅞" O.D.S. | 7 | 3½ | 3½ | — | ¾ | 1⅛ |
| MI-21-1⅛S | 1⅛" O.D.S. | 7¼ | 3⅝ | 3½ | — | ⅞ | 1⅛ |
| MI-21-1⅜S | 1⅜" O.D.S. | 8⅞ | 4⅞ | 3¾ | — | 1 | 1⅝ |
| MI-21-1⅝S | 1⅝" O.D.S. | 9 | 4½ | 4 | — | 1⅛ | 1¾ |
| MI-21-2⅛S | 2⅛" O.D.S. | 9 | 4½ | 4½ | — | 1⅜ | 2⅛ |

*Only one port has sensitized moisture element.

## THE PERFECT COMPANION TO "DRI-COR" REFRIGERANT FILTER-DRIERS FOR COMPLETE SYSTEM PROTECTION

# Study Group Bogs Effort To Stiffen Detroit Heating Regulations, Thumbs Down 'Comfort' Requirement

*By George M. Hanning*

DETROIT—An attempt by a group of warm air heating contractors to protect themselves against so-called "fly-by-night" operators through stiffer city ordinances was frustrated at least temporarily by a city-heating industry code study committee.

The contractors, through the Better Heating & Cooling Bureau, are pressing for a city ordinance to license heating contractors or for stiffening of present licensing requirements.

The city's Department of Buildings and Safety Engineering now licenses installers of oil and gas burners and of hot water and steam boilers. But it has no jurisdiction over the heat distribution system.

While the city's building code encompasses standards for heating distribution systems, the bureau contends that much poor and unsafe installation work gets by busy building inspectors.

The bureau would like to see a single licensing responsibility for the entire heating installation.

In an attempt to give the Department of Buildings and Safety Engineering some authority over heat distribution systems, a proposed ordinance was presented to the code study committee for consideration.

In effect this ordinance would require heating systems to be capable of heating the habitable rooms in a residential type building to at least 70° F. when outside temperature is -10° F.

The proposed ordinance was rejected by the committee. Even the bureau was against it as not going far enough.

Representatives of plumbing and heating contractors and oil heating contractors were vociferous against any attempt to "legislate comfort" or add to present controls over contractors.

Albert Cohen, representing the Detroit Association of Plumbing Contractors, argued that "fly-by-nighters" cannot be legislated out of existence.

He said that plumbing contractors have been trying every possible means of eliminating them for 25 years and yet today an estimated 35% of dollar volume in the plumbing industry is done through that type of contractor. He charged that some heating contractors who were behind the proposed ordinance fell in that category.

Milton Moss, representing the Oil Heat Institute, asserted that his firm services 16,000 oil heating installations, none of which provided inadequate heat or were unsafe.

He objected to legislation that would "tie our hands to the whims of the public.

"The thing that will straighten out this situation," he added, "is for the legitimate contractor to get some backbone and go out and sell good heating systems. Then there will be no room for fly-by-nights.

"The trouble is that there is no good merchandising by good contractors. They are letting the fly-by-nights set the pace for the industry."

Frank Drogosch, chief safety engineer for the City of Detroit, suggested at the end of the meeting, that the industry get together and decide what legislation it wanted, if any, and present it to the city.

## Catalog Describes Radiant Heaters

QUEENS VILLAGE, N. Y.—A catalog (#GC-106) describing its line of baseboard, wall panel, and ceiling-recessed glass electric radiant heaters is available from Berko Electric Mfg. Corp., Catalog Dept., 212-40 Jamaica Ave., Queens Village 28, New York, according to the manufacturer.

## Mobile Homes Boast Baseboard Heating

ELKHART, Ind. — Every model "Pacemaker" or "Atlas" mobile home is now available with Hotpoint electric baseboard heating, according to S. J. "Bud" Lonergan, Jr., president of Lonergan Corp. here, maker of Pacemaker and Atlas homes.

## *Oil Dealers Change Name, Now OHI of B.C.*

NEW YORK CITY—The Fuel Oil Dealers Association of Vancouver, B.C., Can., has changed its name to the Oil Heat Institute of British Columbia, Inc., according to Oil Heat Institute of America.

Close identification of local oil heat associations with the OHI through the use of the words "Oil Heat Institute" in their corporate and publicized name has become more and more universal with the increased public information program conducted by the national organization, it was noted.

**NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.**


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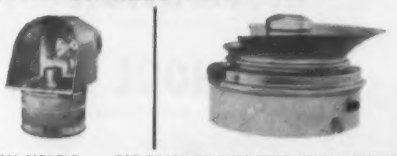

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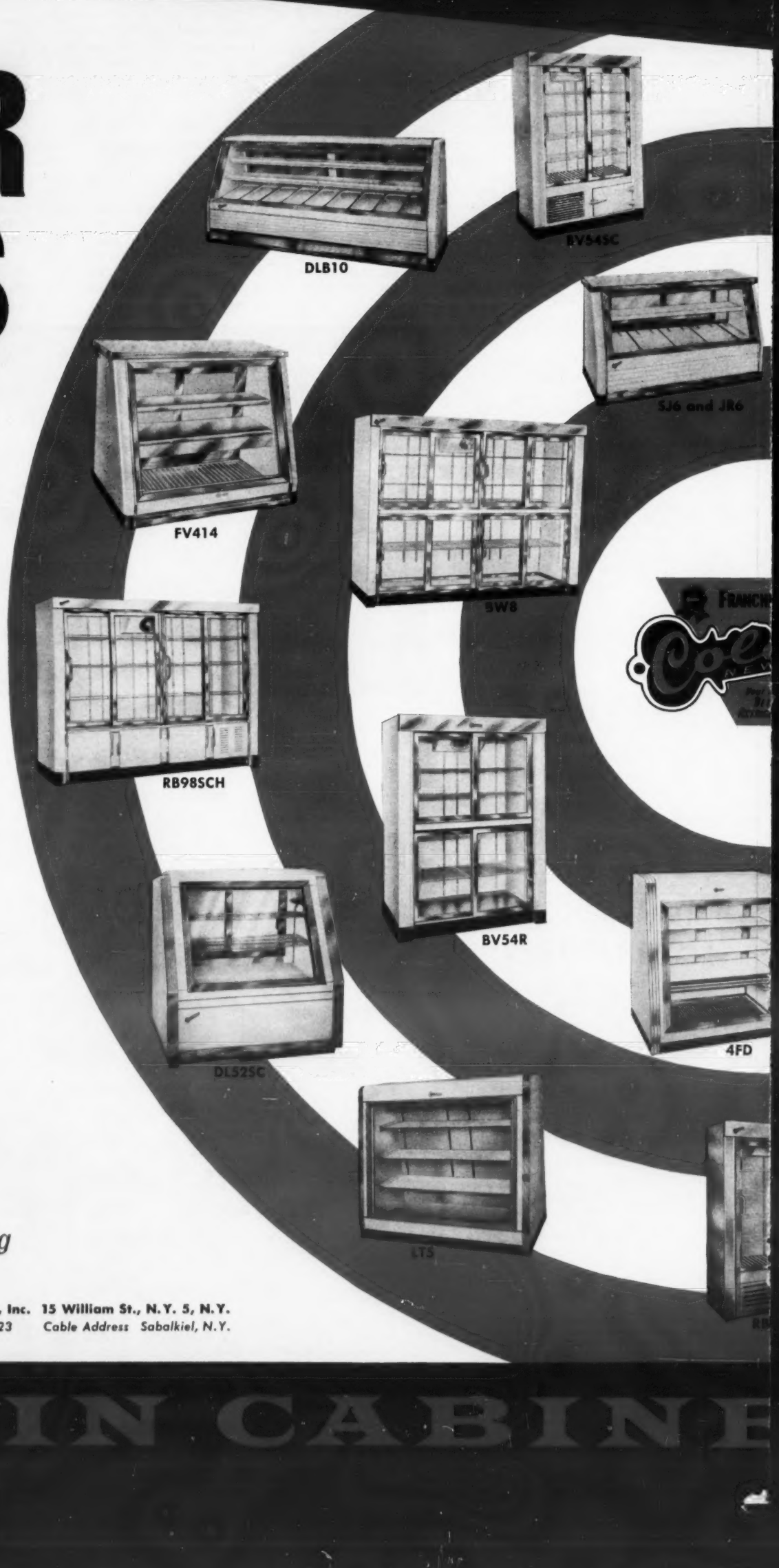


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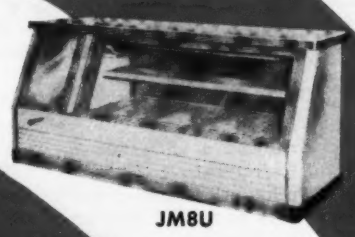
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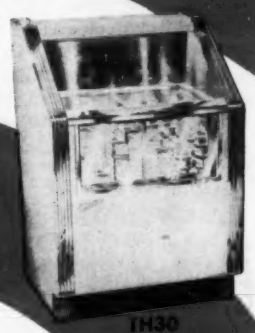
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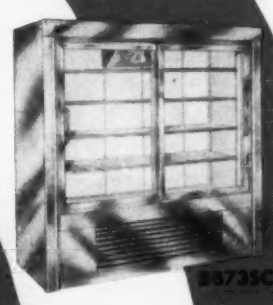
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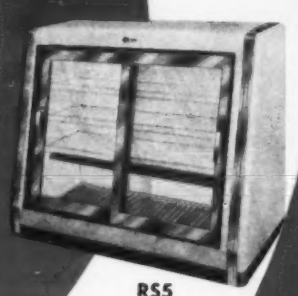
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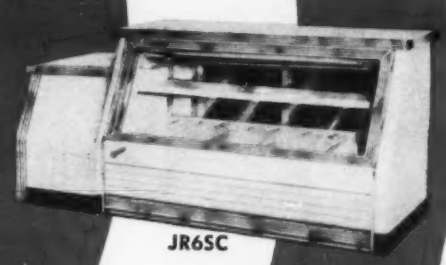
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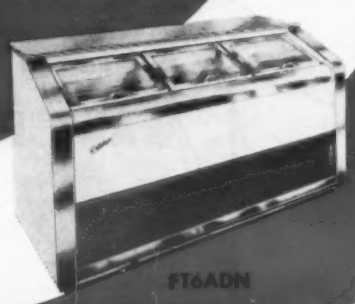
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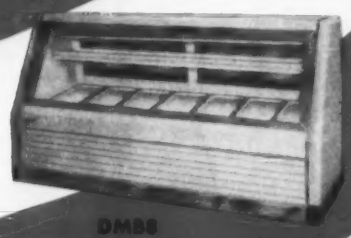
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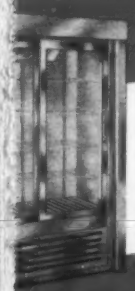
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# Oil, High Temperatures, Crankcase Heaters Discussed In Terms of Maintenance Problems

*By Frank J. Versagi*

DETROIT — "Until very recently, it was commonly held that an R-12 refrigeration system would operate without refrigerant or oil breakdown to discharge temperatures of about 250° F. This is not always the case," stated Wallace Smith, technical service representative of General Chemical Div., in a talk before the Refrigeration Service Engineers Society here.

"We have seen very clean and dry systems operate satisfactorily with discharge temperatures as high as 350°," Smith continued, "and we have seen chemical breakdown at 150° in a wet or dirty system."

Even these general observations do not always apply, he explained, and cited the example of a 2,000-ton centrifugal system in which acid had seriously attacked the aluminum alloy impeller — even though operators periodically checked moisture content and kept it below 3 p.p.m. The cause: defective bearings caused the impeller to scrape slightly against the housing. Through friction, localized temperatures hundreds of degrees above normal acted to break down the refrigerant and oil.

Compressors with the same horsepower rating, operating on identical jobs, may have discharge temperatures very different from each other, an RSES member pointed out. Smith explained that this could be due to differences in the size of the discharge port or in machined clearances. Occasionally, manufacturers are forced to change such dimensions if a line of their compressors tend to overheat.

On a related subject, Smith explained bearing failures on outdoor compressors can be due to phase separation of the refrigerant and oil during cold weather. On start-up, the forced feed lubrication system may pump a phase containing 93% R-22 and only 7% oil, say, wiping the bearings clean of oil and causing them to seize.

Crankcase heaters help solve this problem, but care must be taken that the oil is not heated so much it loses its lubricity, the "Genetron" representative warned. Also, the oil may carbonize at high temperatures. This is more of a problem with high-boiling point refrigerants, as R-11, which are difficult to drive out of oil once they have been absorbed.

It is not unusual for large system operators to check oil monthly, even weekly, for discoloration and acidity, Smith concluded.

Charles B. Price, General Chemical sales representative, showed a slide film on "Oil In Refrigeration Systems." Two other slide films, one on moisture and the other on changing refrigerants in the field, are available for educational groups, Price said.

## You Asked About It

**From the many requests for information it receives, the NEWS will select and publish some of general interest. In many instances, the answers will be supplied by industry authorities.**

**Q. Recently you ran a series on the use of instruments in refrigeration service work. I have purchased an ohmmeter, but I am confused by the fact that the needle doesn't move when there is resistance and moves all the way across the scale when there is almost no resistance. What is infinite resistance?**

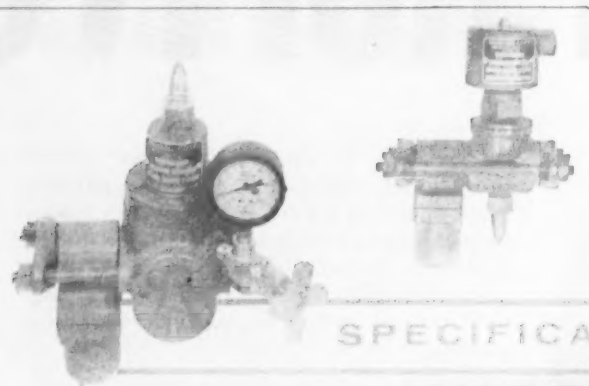
**C.S.S.**
**Cleveland**

A. A careful reading of the instruction bulletin which accompanies such instruments should help you.

Briefly, all electrical measuring instruments react to current flow; strictly speaking they are measuring amps. But the scale is calibrated in volts or ohms, since it is possible to make the current reflect either voltage or resistance by proper engineering of the instrument.

An ohmmeter measures resistance. Since the current gets less as the resistance increases, no current will flow at all if the resistance is really infinite (unlimited) so the needle does not move. If resistance is low, say a short length of copper wire, the batteries in the ohmmeter will be able to pass a large amount of current, so the needle will deflect.

But, observe that the calibrated scale on an ohmmeter runs in reverse of that on an ammeter. Just for an example, say that the meter is calibrated to read zero ohms when it passes 5 amps. with a higher resistance, it will pass less than 5 amps., and the reading, in ohms, will be more than zero—although you will be reading from right to left, rather than from left to right as is more normal on voltmeters and ammeters.

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# Water Regulating Valves For Cooling Equipment (I)

**In this series of articles, R. H. Luscombe, Penn Controls, Inc., reviews the basic principles and applications of water regulating valves used on water-cooled refrigeration equipment. Luscombe touches on valve construction, application products, and service.**

***By R. H. Luscombe, Penn Controls, Inc., Goshen, Ind.***

The two basic reasons for using water regulating valves are:

1. To modulate water flow to the condenser for the purpose of maintaining head pressure or condensing temperature within optimum limits, regardless of variations in water supply temperature and pressure.

2. To provide maximum economy in the use of water.

The following sketches show schematic representations of a typical valve and its usual application. Fig. 1 shows the principal components of a water valve.

A heavy-duty high-pressure bellows is connected to the compressor discharge connection, to the condenser or to the receiver to sense high side pressure. Forces created by the pressure changes and any resulting movements are carried to a valve stem and valve disc.

The stem extends through the valve port (seat) to an opposed compression spring which is provided with a means of adjustment. This adjustment permits setting of the opening or closing point of the valve disc with relation to some desired pressure.

The water is sealed by means of synthetic rubber diaphragms on both sides of the valve body. Valve stem guides which keep the stem and disc in proper alignment are mounted **outside** the diaphragms so as to prevent corrosion and sedimentation of the "working parts." The areas of the diaphragms are balanced with relation to port area so that the opening point of the disc in relation to head pressure varies only a few pounds with widely varying water supply pressures.

The valve disc moves off the seat with the direction of water flow and closes against water flow. This minimizes any tendency to "chatter," or snap shut when the disc is close to the seat. The poppet-type valve provides maximum flow with minimum bellows travel because a disc movement of only one fourth the port diameter gives full equivalent port area.

It should be understood that this type of valve is a true modulator and can only change water flow as a result of a **change** in head pressure.

If water pressure and temperature, and heat disposal change over wide limits, then head pressure must also change. This head pressure change is within acceptable limits and the amount of change varies with several factors including valve size selected, whether or not seasonal adjustments are made, and how wide the load, water temperature, and water pressure vary.

Minor fluctuations of head pressure sometimes result from the "hunting" action set up by the expansion valve.

Heat disposal through the condenser per ton of load is nominally 15,000 B.t.u.h. This is based on 12,000 B.t.u.h. per ton plus 3,000 B.t.u.h. for heat of compression, motor, heat, etc. 15,000 B.t.u.h. = 250 B.t.u. min.

Assume 105° maximum condensing temperature is desired. 105° F. = 126 p.s.i. on R-12 or 213 p.s.i. on R-22. Condensing temperature will be about 10° higher than outet water temperature which would be 95°. If inlet water is 85° maximum, then water will absorb about 10° and discharge at 95°.

One gallon of water = 8.34 lbs. 8.34 x 10° = 83.4 B.t.u. per gallon. 250 B.t.u. per minute per ton ÷ 83.4 = 3 gallons per minute per ton.

This is generally the basis for design of condensers and cooling towers. Obviously, more water is required if the inlet temperature is higher than 85° and less water if inlet temperature is below 85°.

R-12 valves are customarily factory set to begin to pass a small "trickle" of water at 105 p.s.i. They will close off 6 to 8 lbs. below the opening point. R-22 valves are factory set at 180 lbs. opening point.

Where ambient and water temperatures are in the range of 85° to 90°, the opening (or closing point) of the valves should not be set below the factory adjustment or the valve may fail to close when the compressor stops. In low ambient temperatures and low water temperature applications, it is possible to raise the opening point of the valve to develop higher head pressures if desired.

If compressors are located where both ambient and water temperatures vary widely, some installers make seasonal adjustments. However, if the valve is selected properly to meet the maximum load at highest water temperature and lowest water pressure it will maintain usually acceptable minimum head pressure under low water temperature and ambient conditions without further adjustment.

*(To Be Continued)*

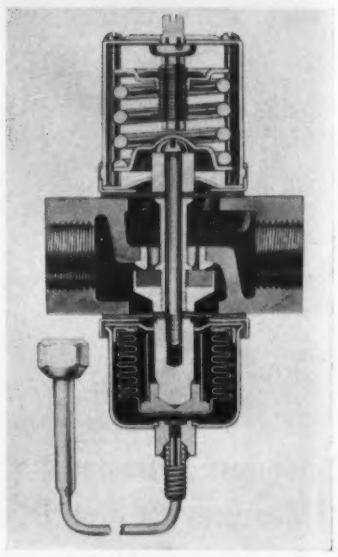

FIG. 1—Typical water regulating valve described in text.

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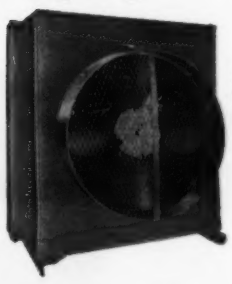

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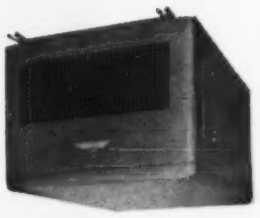

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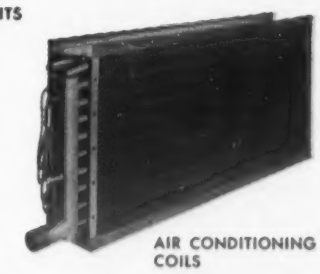
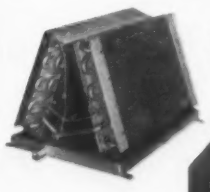
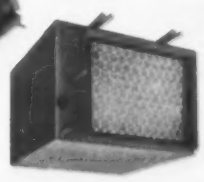
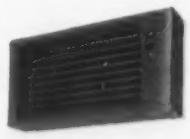


AIR CONDITIONING COILS



RESIDENTIAL AIR CONDITIONING COMPONENTS





see your wholesaler for full details

LARKIN COILS INC.

519 Memorial Drive, S.E. • Murray 8-3171
P.O. Box 1699, ATLANTA 1, GEORGIA

## Tong Test Ammeter Measures ½ Amp DC

● A new type PB tong test ammeter, primarily designed for measuring small amounts of direct current, in one-half ampere divisions, from 0 to 10 amperes, is offered by Columbia Electric Mfg. Co., Dept. AH&RN, 4519 Hamilton Ave., Cleveland 14.

In addition, the type PB can be used to read both a.c. and d.c. up to 20 amperes.

Measurements are taken by clamping the tongs around the electrical conductor, without breaking either the circuit or insulation.

Jaws can accommodate conductors up to ½ in. diameter. Two ranges are provided on one dial, 10-0-10 amperes for d.c. only and 0-20 amperes for both a.c. and d.c., the firm said.

## Humidifier Heating Element Is Immersed

● A new electric humidifier for use in any forced air, vertical plenum furnace is being marketed by Viking Air Products, Div. of National-U. S. Radiator Corp., Dept. AH&RN, 5601 Walworth Ave., Cleveland 2.

Trade-named the Viking "4200," the humidifier features a new heating element that is completely immersed in a ceramic water pan for instant boiling action, according to the company.

This element is said to supply a constant rate of moisture to the airstream for correct humidification under all conditions. It is regulated by the "Ultra Vapor" control dial that can be set for low, medium, or high humidification.

Features of the Viking 4200 include a "Teflon" coating that "simplifies cleaning by diminishing lime build up on the casting," an unbreakable ceramic pan, and a lifetime nylon valve, the company said.

## Develop Multipigment Stainless Steel Paint

● Vita-Var Corp., Dept. AHRN, 10 Commerce St., Newark 2, N. J., announces that its research laboratory has developed a multipigment stainless steel paint, #13448, "which represents a significant advance in the durability of maintenance paints for exposed steel as well as aged galvanized iron."

## Magic Markers Print On Any Surface

● Three new marking devices designed to solve 90% of all industrial marking problems have been developed by Speedry Chemical Products, Inc., Dept. AH&RN, P. O. Box 97, Richmond Hill, Jamaica 18, N. Y.

"Indelible marking on all surfaces, whether porous, non-porous, clean, smoothy, dirty, rough, oily, metal, concrete, lumber, or other material, can be achieved with one or more of the new large-size 'Magic Markers,'" it is claimed.

## Fan Coil Unit Has Three-Speed Control

● A new fan-coil unit said to provide all-season air conditioning with hydronic systems for residential and commercial applications was introduced recently by the Heating & Air Conditioning Div., National-U. S. Radiator Corp., Dept. AH&RN, 944 Ash St., Johnstown, Pa.

The "Spotaire VRS" fan-coil unit features a three-speed push-button individual room control and a new optional 10 by 4-in. adjacent room supply. The latter "permits the conditioning of two small rooms with a single VRS fan-coil unit," it was stated. "Damper-controlled diverted air is directed through flush mounted grille into second room."

Units can be recessed between standard 16-in. studs or installed free-standing in existing buildings.

Spotaire units are furnished in two sizes: Model VRS-2-150 has a rated nominal capacity ranging from 2,500 to 5,500 B.t.u.h. with a 150 c.f.m. air flow rate. Model VRS-2-300 is rated at double the capacity of the smaller unit.

**Want More Details?**

*ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.*

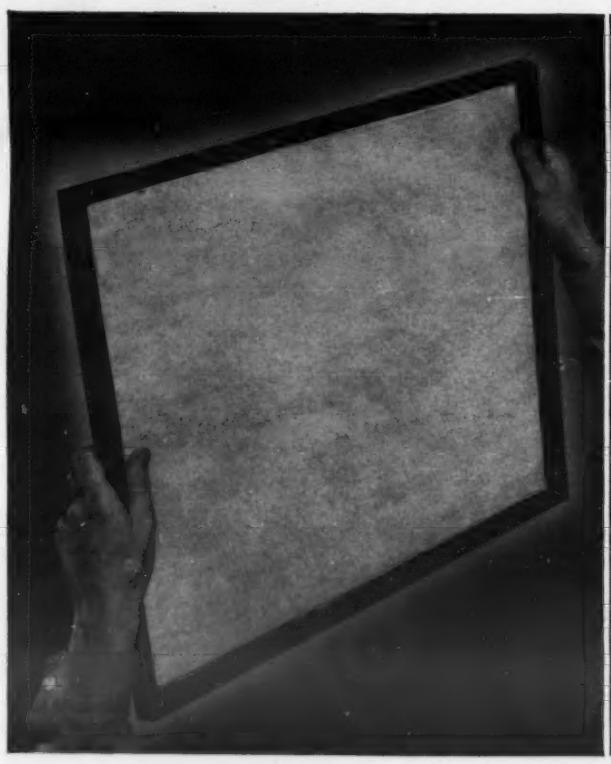
## Baseboard Diffuser Is Economy Priced

● The "Valuaire," a new "economy-priced" baseboard perimeter diffuser for heating or combination heating-cooling systems, has gone into production at The Auer Register Co., Dept. AH&RN, 6600 Clement Ave., Cleveland 5.

"The 18-in.-long unit is designed especially for housing project applications where low cost is necessary," the company said. "It features a flowing-line design which blends with any type construction and produces diffusion capacity that is equal to that of longer units."


# NOW from FRAM®... world leader

# FRAM permachem treated Air Filters



## NEW FRAM permachem treated AIR FILTERS

Kill 99+% of the germs that breed in filters. • Stop mold, mildew, musty filter odors • Hold up to 34% more dust in AFI test procedures • Exclusive anchor-locked frame cannot settle, vibrate, blow, or soak loose • In sizes for all forced air furnaces and air conditioners, also rolls and pads.

## IMMEDIATE ACCEPTANCE BY ORIGINAL EQUIPMENT MANUFACTURERS

Eleven leading manufacturers of air conditioning equipment have already selected FRAM permachem treated Air Filters for use in their 1960 models. (Their names will be announced in December.) FRAM's sensational plus features will be promoted by these manufacturers in their sales and merchandising programs.

## Expansion Absorber Uses Sliding Piston

● Introduction of a new sliding piston type expansion absorber has just been announced by Cobra Metal Hose, Dept. AH&RN, 5059 S. Kedzie Ave., Chicago 32, Illinois.

"Featuring a unique piston within a cylinder design, the new expansion absorber utilizes a proven mechanical principle combined with sure-sealing rings," it was stated.

"Foreign matter is kept from entering the mechanism at the end of the cylinder by a hygroscopic seal.

Expansion and contraction of pipe in all hydronic heating systems is compensated for by the piston action.

## Simpson Adds 270-Volt Testing Instrument

● Addition of model 270 volt-ohm-milliammeter to its line of test equipment has been announced by Simpson Electric Co., Dept. AH&RN, 5200 W. Kinzie St., Chicago 44.

The company said the model can be used for day-to-day variation checks in circuit operation "and it offers a predictable accuracy over a wide temperature range—67° to 87° F. (D.c. accuracy of 1½% F.S. at 77° F.)"

Self-powered, the model 270 includes all of the features of the 260 plus a mirror scale, ½% resistors, gold bonded diodes, polarity switch, and knife edge pointer it was pointed out. Accessory probes and carrying case are available.

## Morris Adds to Soft Ice Cream Freezer Line

● Newest additions to the "Electro Freeze" line of automatic soft ice cream freezers are models 15 and 30, according to Port Morris Machine, Inc., Dept. AHRN, 712 East 135th St., New York City 54.

Model 30, which has two 2-hp. Refrigerant-22 compressors, is a double-head freezer. Model 15 has a 2-hp. R-22 condensing unit and a 1½-hp. beater motor with a gear reducer.

## Indicates Temperature Over Small Range

● Full-scale temperature readings over a very small range, selectable anywhere in the region from -50 to 500° F, are made possible by the new Royco "Thermitem" temperature-measuring instrument, according to Royco Instruments, Inc., Dept. AH&RN, 365 San Antonio Rd., Mountain View, Calif. Depending on probe design, measurements reportedly can be made on surfaces of either conducting or insulating materials, or inside penetrable masses.

Standard instruments are available with any even 50° or 100° F. scale within the overall range from -50 to 500° F. Scales are linear and accuracy of the instrument is said to be 2% of full-scale reading.

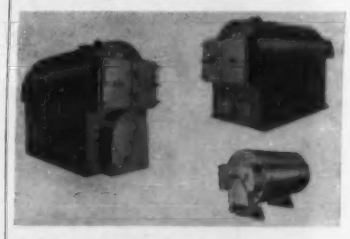
## Can Vary Pitch on Two Maurey Pulleys

● New, highly flexible variable speed drives, with ratios up to 4:1, in the range of ⅛ to 2 hp. using a combination of two variable pitch pulleys, are being produced by Maurey Mfg. Corp., Dept. AH&RN, 2907 S. Wabash Ave., Chicago 16.

Connected by either "A" or "B" belts, one pulley is spring loaded, the other manually actuated, it is pointed out.

"The belt-seating groove of the manually operated pulley is widened and narrowed by turning a hand wheel to control the operation of the drive," it was explained. "Manual actuation of this pulley produces an instant inverse change in the pitch diameter of the spring loaded pulley."

Both pulleys are offered in a size range of 3½, 4, 5, and 6-in. o.d., and can be purchased in combination or individually.



## Federal Redesigns, Expands Boiler Line

● Re-design and expansion of its entire commercial-industrial heating boiler line has been announced by Federal Boiler Co., Dept. AH&RN, Midland Park, N. J.

Federal now offers a selection of more than 88 sizes and models.

The new boilers range in sizes from 1,780 through 64,280 sq. ft. steam and are available in gas fired and oil-fired models.

The re-designed models are in three series: FLW low water line boilers; FLR horizontal fire tube boilers; and FMA and FMB scotch marine boilers. All incorporate new design advantages including new rugged door designs; increased efficiency in insulating properties; improved windbox design for the burning of modern fuels; and increased efficiency in combustion, according to the company.


# in filtration . . . the sensational new that make big profits for you!

## POWERFUL ADVERTISING FEATURES THIS SEAL

Big-space ads in national magazines including THE SATURDAY EVENING POST, newspapers, and radio are telling your customers about the advantages of FRAM permachem treated Air Filters. Merchandising aids featuring FRAM permachem treated Air Filters are being used by original equipment manufacturers and are available to you.

## "YOU'VE NEVER MADE SUCH PROFITS

from air filters before," says Theodore F. Low, President of Sims Corporation, Providence. "You can't miss with Fram's profitable pricing policies, selective distribution, merchandising support, and Fram's famous money-back guarantee."

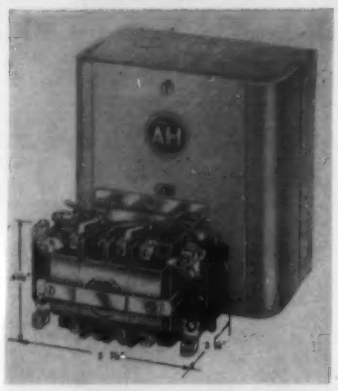
**GET THE FACTS TODAY!** Write **FRAM CORPORATION Dept. FAC Providence 16, Rhode Island**



Trying to find the right man for a hard-to-fill vacancy—the NEWS' Classified Ads are read by your man.

*Place your ad today!*

## Arrow-Hart Adds New Magnetic Control



● A new model of across-the-line magnetic controls for constant speed motors has been announced by Arrow-Hart & Hegeman Electric Co., Dept. AH&RN, 103 Hawthorn St., Hartford 6, Conn.

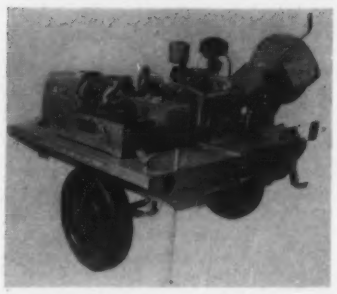
It is the model 58 "RA" across-the-line starters and contactors for NEMA sizes 0 and 1 for single and polyphase operation, rated up to 7½ hp. at 220 volts and 10 hp. at 440 and 550 volts, according to the manufacturer.

Primary features of the model 58 magnetics were listed as epoxy-resin encased coils, wide voltage range coils, general purpose enclosure, and solderless terminals.

## Synthetic Oil Developed for Hydronics

● A special synthetic oil with properties that "make it excellent for hydraulic-type operations" is being offered by Lehigh Chemical Co., Industrial Lubricant Div., Dept. AH&RN, Chestertown, Md.

"Anderol L-386" is a medium viscosity synthetic diester with an operating temperature range of -65° F. to 350° F., it was noted, and is available in pint, quart, and gallon cans, 5 and 55-gal. drums.

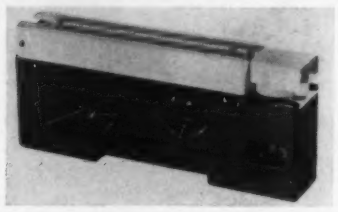


## Pipe Shop on Wheels Hitches to Car, Truck

● Mobile work shops—"ready-to-roll" pipe shops on wheels that cut, thread, and ream all necessary pipe, bolt, and conduit on the job—are offered by Collins Machinery Corp., Dept. AH&RN, 5474 Alhambra Ave., Los Angeles.

The "shops" come in various equipment combinations and can be hitched to car or truck.

The Collins deluxe mobile shop is equipped with "Thred-O-Matic 22," gas generator, Collins "E-Z Cutter," Collins "Abr-A-Saw" with 24-hp. engine and electric starter, work space, and two storage compartments for hand tools. The utility model comes equipped with Thred-O-Matic 22, gas generator, E-Z Cutter, Abr-A-Saw with 12.5-hp. engine and rope starter.

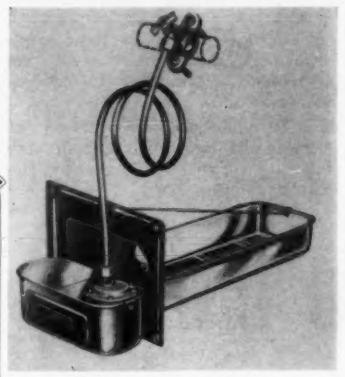


## Flashlight Batteries Power Psychrometer

● A portable battery-powered psychrometer designed to provide accurate readings of wet and dry bulb temperatures for determining relative humidity and dew point is a product of Friez Instrument Div., Bendix Aviation Corp., Dept. AH&RN, 1400 Taylor Ave., Baltimore 4, Md.

Designated the "Psychron," it is designed and manufactured to meet rigid U. S. Weather Bureau specifications, according to the company. Specific humidity, mixing ratio, and vapor pressure can be computed using the wet and dry bulb measurements, it was explained.

The psychrometer operates on ordinary flashlight batteries. It requires no whirling or special technique. Other listed features are steady aspiration exceeding 15 f.p.s. and built-in illumination system.



## Humidifier Made Of Stainless Steel

● Introduction of a new stainless steel "Vaporite" humidifier, employing the water level principle of operation, has been announced by Automatic Humidifier Co., Dept. AH&RN, Cedar Falls, Iowa.

"The Vaporite model No. 999 has been styled to give it greater sales appeal, and re-engineered to improve working parts," the company said. "Its stainless construction makes it less subject to corrosive damage."

Model 999 employs a new type diaphragm seat, and is adjustable to water pressure level. It is shipped completely assembled. Full-length non-breakable evaporating plates are optional equipment.

## Inert-Gas Welding Kit Priced Under $100

● The new "Helicraft 100," a "low-priced" tungsten inert-gas welding outfit, has been placed on the market by Air Reduction Sales Co., Dept. AH&RN, 150 East 42nd St., New York City 17.

Priced at less than $100, the Helicraft 100 is specifically designed to be used by small sheet metal fabricators, plumbers, and in all small companies where the use of Air Reduction's manual "Heliwelding" equipment can be profitably applied, the company indicated.

The kit, which can be operated from any conventional d.c. power source, can be used for producing quality welds on light gauge stainless steel, aluminum, brass, copper, nickel, monel, silver, and all other non-ferrous metals, it was pointed out.

The Helicraft 100, packaged in a steel carrying case, contains all the necessary equipment for Heliwelding in the 100 ampere range and below.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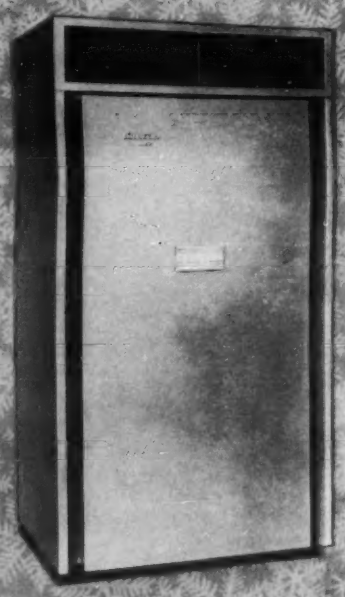
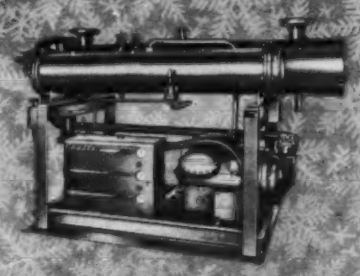
GOOD PROFIT MARGIN IN THE LUXURY LINE WITH "GOLDEN SILENCE" CIRCULATION

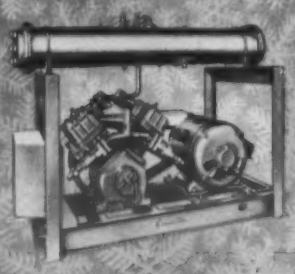
EVAPORATIVE CONDENSERS, COOLING TOWERS AND AIR HANDLING UNITS UP TO 100 TONS



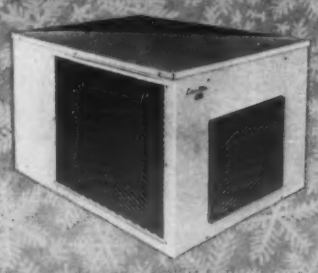
PACKAGED AIR CONDITIONING UNITS 3 THRU 100 TONS



PACKAGED LIQUID CHILLERS 7½ TO 100 TONS WITH SEMI-HERMETIC COMPRESSORS



CONDENSING UNITS UP TO 100 TONS—F-12 OR F-22



PACKAGED AIR COOLED SPLIT SYSTEMS THROUGH 10 TONS

See our exhibit—Booth 209
Air Conditioning & Refrigeration Exposition • Atlantic City, N. J.
Nov. 2 thru Nov. 5, 1959

All CURTIS air conditioning equipment is priced for profit—competitive prices on all units include a generous profit margin for you. Curtis "packaged" air conditioning equipment is all factory assembled and factory tested—it is easy to sell . . . easy to install.

THE BALANCED COMPONENTS in each CURTIS air conditioner assure a minimum of maintenance, quiet operation and maximum cooling efficiency.

Sell the nationally advertised line that sells itself.

CURTIS AIR CONDITIONS AMERICA

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Curtis
MANUFACTURING COMPANY
REFRIGERATION DIVISION
OUR 105th YEAR

WRITE DEPT. 1, ST. LOUIS 20, MISSOURI

## Moisture Indicator Spells Out Wet, Dry

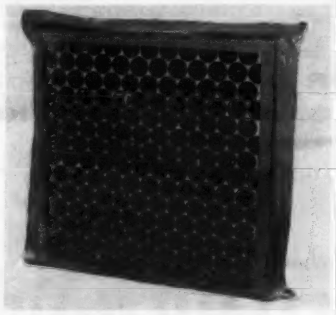
● What is said to be "an entirely new concept in a moisture liquid indicator" in which the degree of moisture content of the refrigerant is actually spelled out as "wet" or "dry" is being introduced at the All-Industry Exposition in Atlantic City by Henry Valve Co., Dept. AH&RN, 3215 North Ave., Melrose Park, Ill.

It is called the "Dri-Vue" moisture liquid indicator and is adaptable for use on original equipment and existing installations using Refrigerants 12 and 22.

"The Dri-Vue moisture liquid indicator," said Robert Carvell, sales promotion manager, "employs a moisture sensitive element that changes color in relation to the amount or degree of moisture present.

"The Henry Dri-Vue design is unique, however, in that it not only provides a color approach to moisture presence through a large viewing window but, more important, actually spells out the word 'wet' when excessive moisture is present. The word 'dry' shows up plainly when the moisture content has been reduced to a safe level.

"Henry's combination color viewing and spelling, in our opinion, greatly simplifies field servicing," Carvell added.



## Disposable Filter Takes Out Odor, Too

● A new disposable activated carbon odor filter has been introduced by American Air Filter Co., Inc., Dept. AH&RN (PD), 215 Central Ave., Louisville 8, Ky.

"Representing a new concept in odor filter design, the new filter combines high-efficiency odor removal with a high degree of air cleaning in one low-cost, disposable-type unit," the firm said.

Pointing out that its filter requires no reactivation, the firm added that the filters are sealed in vapor-proof cartons and are completely protected from odor absorption while in shipment, in storage, or during installation.

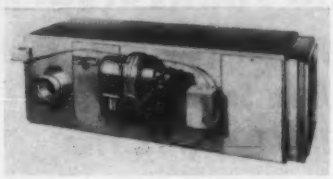
AAF odor filters are offered in four standard sizes to fit in standard 2-in. frames.

## Alloy Needs No Flux On Copper Joints

● "Ambraze 211," a new brazing alloy that reportedly replaces silver solder and does not require flux on copper-to-copper joints has been announced by American Brazing Alloys Co., Dept. AH&RN, P.O. Box 11, Pelham, N. Y.

"A joint brazed with #211 will prove to be stronger than the parent metal," the company claims. "Its ease of application and lower time required for installations assures cost savings.

## Two Horizontal Furnaces Added by Armstrong



● Addition of two newly-designed horizontal furnaces to its line of heating equipment has been announced by Armstrong Furnace Co., Dept. AH&RN, 851 West Third Ave., Columbus 12, Ohio.

New are gas-fired and oil-fired models which have been completely redesigned to give greater performance and flexibility, the company indicated.

Gas-fired horizontal models are available in 80,000, 100,000, and 135,000 B.t.u. input per hour. Blower motors are available in three types: shaded-pole, split-phase, and permanent split capacitor.

Diverter and burners may be placed in the front or rear of the furnace to allow for flexibility in installation.

New oil-fired horizontal furnaces are available in 84,000, 112,000, and 135,000 B.t.u. output per hour. The three blower motors listed above are utilized in these oil-fired models.

"Flexibility is brought about by the ease each furnace can be changed from air discharge left to air discharge right," it was pointed out.

"You need only rotate the furnace end over end, turn the burner upright, and relocate the blower and fan-limit control to alter the air discharge direction."

**Want More Details?**

*ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.*

## Eliminates Field Service on Water Coolers

● New water coolers with "Packaged Cooling"—described as a "new refrigeration concept that eliminates major field service"—are being offered by Sunroc Corp., Div. PC, Dept. AH&RN, Glen Riddle, Pa.

The company claims that the coolers can be guaranteed for a longer period of time.

"'Packaged Cooling,'" the announcement said, "refers to the separate inside cabinet that houses the entire refrigeration system in new Sunroc Advanced Coolers, Wall-Hung Coolers, and Remote Coolers. Only 12$\frac{9}{16}$ in. by 20 in., this compact inner cabinet is a self-contained unit that permits more convenient installation, and is easily removed for prompt factory service or replacement as guaranteed. Major service is thus accomplished without removing the entire cooler—or without dismantling the cooler cabinet.

"Sunroc Packaged Cooling provides instantaneous cooling of fresh water drawn through seamless copper coils with reserve capacity for peak requirements."

Sunroc Advanced Coolers also feature inside plumbing for flush-to-wall installation. Wall-Hung Coolers are designed for wall mounting at variable heights to meet child or adult requirements.

619 DEVICES for refrigeration and air conditioning control and their full specifications are organized for quick reference in the newest CC catalog. Only the basic models are illustrated on this page. *You should have the whole catalog.* Write for CC Catalog W-5-S today to the address below.

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# LaCrosse Cooler Celebrating 25th Anniversary

MANAGEMENT conferences solve production problems as they arise. From left: sales manager, William Ebner; president and founder, R. S. Denzer; secretary and treasurer, W. W. Newberry; vice president and service manager, W. R. Trapp.

## *Pioneer Firm Progressed From Small Garage to 110,000 Sq. Ft. Plant*

LA CROSSE, Wis.—La Crosse Cooler Co. is celebrating its 25th year in manufacturing.

The company started out in 1934. Its embryo: a man with a desire to fabricate a high-grade line of commercial refrigeration equipment, a garage as a workshop, and a meager supply of tools, materials, and capital.

During the next few years, the La Crosse Novelty Box Mfg. Co., as it was designated by its founder, R. S. Denzer, had to change location many times to gain much needed manufacturing space.

It was during this period, the company points out, that the present-day principals, W. R. Trapp, W. W. Newberry, and W. A. Ebner, joined with Denzer in exerting their energy toward the company's goal: that of producing a top-quality product.

Production at that time consisted mainly of beer dispensing equipment and bottled beverage coolers along with deluxe custom-built bar equipment. When war broke out, production facilities were switched to the war effort.

In 1946 the company's progress was enhanced by the construction of the first portion of today's modern office, factory, and warehouse facilities.

As the engineering staff headed by the company president, Denzer, continually broadened its scope of experimentation and design, the firm's name was altered to the more inclusive designation—La Crosse Cooler Co.

In the short space of three years, two additions to the original building were necessary with the result that today's structure covers 110,000 sq. ft., of which 70,000 is utilized for actual production.

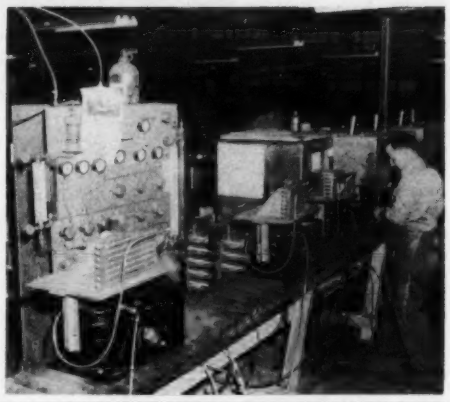
"With this background in the commercial refrigeration field, and recognizing the tremendous market potential in the vending equipment field, a research team headed by President Denzer was established to probe this sphere of marketing and production," it was noted.

This research, planning, and testing culminated in 1954 with the introduction of several models of coin-operated selective venders. Encouraged by the "fine reception" these first models received, the research group increased its activities.

Today, the Vending Machine Div. is firmly established as an integral part of the company's organization and "is already a recognized name in the vending machine field."

In addition to over 50 models of commercial refrigeration equipment, La Crosse Cooler currently produces seven different models of its upright visual selective soft drink vender. Units are leaving La Crosse daily to the entire United States and Canada as well as many foreign countries including Switzerland, Germany, Iceland, Venezuela, Norway, Saigon, and others, the company said.

THIS SMALL garage was where La Crosse Novelty Box Mfg. Co., as it was known then, began manufacturing in 1934.



UNITIZED refrigeration system permits fast field service on selective venders.

*Thinking of—*

- **changing territories**
- **expanding your territory**
- **taking on new lines—**

Check the
**CLASSIFIED ADS**

*Your opportunity may be there.*


# SERVICE

Reason why — it Pays to Specify
United **Seamless** Copper Tube

Personal interest, attention to detail, and shipments geared to meet your schedules — that's United Service! Couple this with seamless tube quality that is the product of the industry's finest statistical quality control system — then, you know why it always pays to specify United! Available color-coded . . . in straight lengths, or packaged in coils . . . thru your wholesaler.

**United Wire and Supply Corporation**
Providence 7, Rhode Island

Handy-hole packaging is typical of United's broad program of handling and inventory simplification.

For silver brazing alloys . . . For aluminum, brass and copper wire and tube . . . always Specify

# UNITED

**FOR REAL PROTECTION AGAINST CALL BACKS**

*. . . use the* genie *in the bottle of*

# THAWZONE®

To keep customers satisfied and to avoid costly call backs, add *Thawzone* to the refrigerant. In it, there's a chemical genie that works like no other dehydrant to cure and prevent trouble in air conditioning and refrigeration systems.

*Thawzone actually destroys moisture. There is no water left in the refrigerant to return when the temperature rises. It works faster, reaches all parts of the system, gives sure results, and costs less to use . . . and there's no pressure drop.*

- eliminates freeze-ups
- minimizes corrosion and copper plating
- destroys moisture and acids
- helps keep valves free of sludge and rust
- scavenges out oxygen

Take *Thawzone* on *every* job . . . use it in *every* installation charged with the modern fluorine refrigerants (Freon*, Genetron*, etc.), or with methyl chloride, methylene chloride or isobutane. A little treats a lot . . . only ⅛ oz. is needed for a pound of refrigerant.

*Reg. Trade Names: Du Pont & Allied Chemical Corp.

Ask your refrigeration wholesaler today for Thawzone in the new SHO-PAK carton, and the free Thawzone Service Manual.

**HIGHSIDE CHEMICALS INCORPORATED**
18 COLFAX AVENUE • CLIFTON, NEW JERSEY

TWO OTHER AIDS FOR YOUR SERVICE KIT

**TRACE** — the simple fast way to pinpoint refrigerant leaks . . . a positive leak tag.

*Leak Lock* — the joint sealer engineered for refrigeration use.

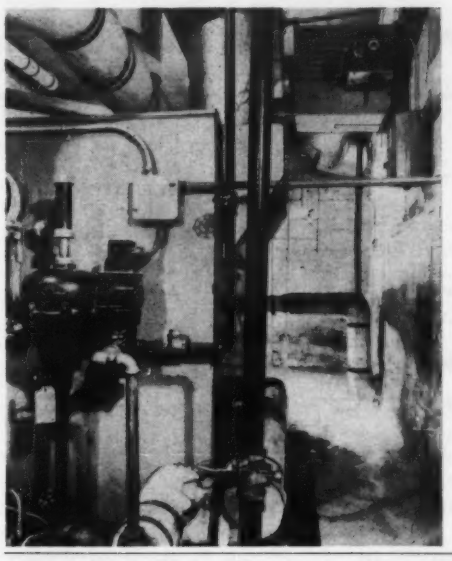
## Coleman Occupies New Southwestern Branch Dallas Headquarters

DALLAS — The Coleman Co. has occupied its new southwestern branch headquarters at 8929 Diplomacy Row in Brook Hollow Industrial District here.

The 15,000-sq. ft. warehouse and office building was completed in September, and was opened shortly thereafter. It has 1,600 sq. ft. of air conditioned office space.

The southwestern branch includes Texas sales office and warehouses in Houston, San Antonio, and El Paso. Other branch offices are in Wichita, Chicago, Los Angeles, Philadelphia, and Atlanta.

Mark Darmer is southwestern branch manager and Merle Crist is his assistant.



## Inducing Drafts In A Hollow

FOUR COTTAGES for stable help at Belmont Park race track are located in a hollow, where adequate natural draft for hot water heating boilers was difficult to get. Tall stacks were costly, marred scenery. Wing draft inducers, an airfoil fan in a metal housing, mounted between boiler and breeching, insure proper draft, require only stub stacks.

## Printing of Oil Servicing Exam Forms Starts

NEW YORK CITY—The first printing of 1,000 examination forms for certifying oil heat service men under test standards prescribed by the Oil Heat Institute of America will be completely exhausted by December, according to Robert Hundley, Steinen Mfg. Co., chairman of OHI's Education Committee. They are being reprinted.

Under the OHI's certification process, every serviceman taking the examination and receiving a grade of 80% or better receives certification in the form of a wallet card and pin which states he is an OHI of American Certified Oil Heating Technician.

Companies, whose servicemen have been so certified can obtain decalomanias from the OHI attesting to this fact which may be displayed by the company.

Firms participating in this certification project will have to have 51% of their servicemen certified in order to display the decalcomania. Certification exams will be given each year in various areas of the country, under a schedule to be announced later.

It is anticipated that by the end of next year 6,000 oil heating service mechanics will have been certified and qualified under OHI standards.

## 'Different' Type of Heating Season from Weather Standpoint Forecast

MINNEAPOLIS—An "entirely different" heating season from the standpoint of "climatological probabilities" this coming heating season, as compared with the 1958-1959 season, has been predicted by Irving P. Krick, president, Irving P. Krick Associates, Inc., Denver, well-known forecaster of long-range weather probabilities for industry.

Speaking at a conference for business editors conducted by Minneapolis-Honeywell Regulator Co., for whom he will make special forecasts in 1960, Krick's statements seemed to indicate a likelihood of more severe temperatures early in the heating season, but with the over-all winter being considerably milder.

"Our prognosis indicates an entirely different season than last year," Krick declared. "For example, here in Minneapolis, we expect the heating degree-day accumulations to greatly exceed those of last year during the early part of the season.

Total degree-day accumulations for the winter will not reflect much change from last year, but the early season demand for heating fuels may produce a very different sales picture for all types of fuel.

"Further East along the Atlantic Seaboard, a somewhat similar situation will develop in which the cumulative degree days through November will exceed the figure for last year, but by the end of December, will be considerably below the totals reached at that time in the 1958 season.

"In fact, the total accumulations for the season will be considerably less than last year, reflecting differences, not only in monthly but in total seasonal demand for heating fuels."

## Contest To Spur Replacement Heating Sales Rewards Dealer and Customer

PHILADELPHIA—J. Levitt, Inc., franchised distributor for American - Standard furnaces and air conditioning in the Delaware Valley area, is offering a new automobile as grand prize for the dealer who wins the Levitt fall furnace replacement contest.

According to Seymour Blau, vice president of J. Levitt, "Each time one of our dealers sells an American-Standard furnace (gas or oil) for replacement of an old unit, his customer (the homeowner) has an opportunity to win a RCA 1960 color television by completing a sentence outlining the reasons why he purchased an American-Standard furnace.

"The dealer who sold the winning furnace wins a 1960 Chrysler 'Valiant' automobile."

According to J. Levitt, all entries will be judged by the Reuben H. Donnelley Corp., an independent contest-judging organization. The winner will be selected on the basis of the best presentation of the reasons why the buyer selected an American-Standard unit.

To qualify for the contest, the consumer must purchase his American-Standard furnace from a J. Levitt dealer between Sept. 15 and Dec. 14, 1959.

"We wanted an exciting incentive to our dealers to push the sale of American-Standard equipment for modernization during the fall selling season," Blau pointed out. "We also wanted to know what sales features were most effective in influencing the consumer to buy an American-Standard furnace.

"Finally, we wanted to be sure that the dealer himself became thoroughly familiar with all of the sales features of the American-Standard line of winter air conditioners and that he would use those features in his selling. A contest of this type accomplishes these aims."

"Early results," Blau said, "already show that this contest will stimulate a good deal of additional business for us. Equally important, the information we gain will prove invaluable in helping us to help our dealers to sell more furnaces in the future."

**NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.**

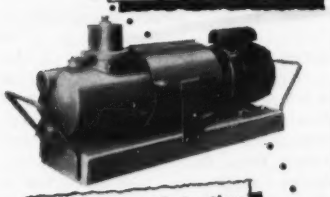
Servicemen Agree...

BEACH-RUSS PORTABLE VACUUM PUMPS

are made with features they desire

High Performance Characteristics

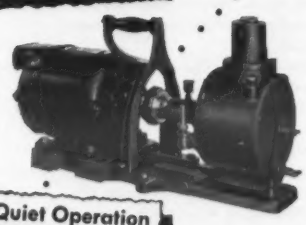
Completely Portable



Automatic Lubrication

Single- or Two-Stage

Long Life



Quiet Operation

Minimum Attention

Valves Eliminated

*Beach-Russ Vacuum Pumps are also made in types and sizes for evacuation and testing of refrigeration equipment on a production basis.*

BEACH-RUSS COMPANY
620C GRAYBAR BLDG., NEW YORK 17, N. Y.

Send descriptive literature covering
☐ Model O Single-Stage Vacuum Pumps.
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CITY..... ZONE..... STATE.....

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Profitable, rejection-free brazing results depend upon alloy uniformity. That's why United scientifically controls this vital factor through the modern miracle of spectographic analysis, the most positive alloy check ever developed! Another reason why it pays to specify United Sil-Bond and Phoson silver brazing alloys. Available in coils, straight lengths and pre-formed rings through your welding supply wholesaler or direct from:

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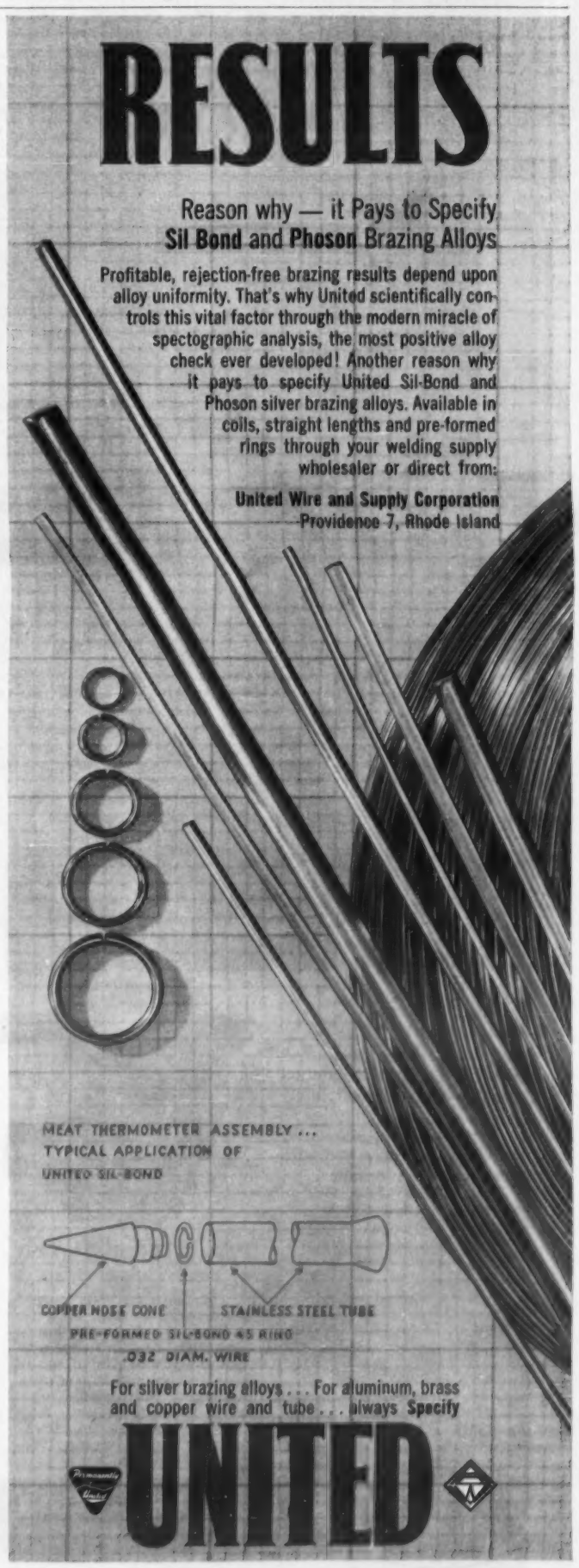
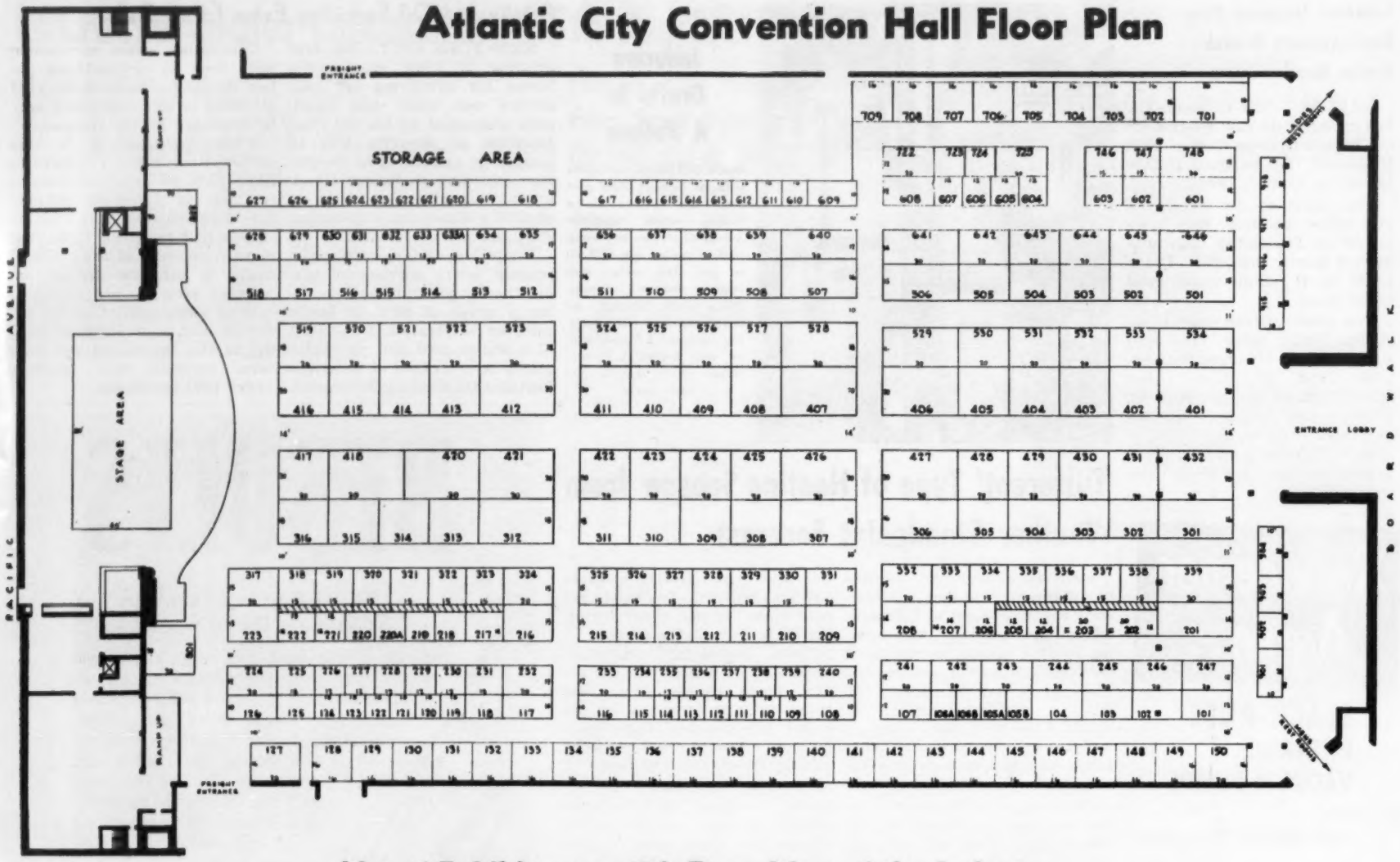



For silver brazing alloys... For aluminum, brass and copper wire and tube... always Specify

UNITED

# Atlantic City Convention Hall Floor Plan

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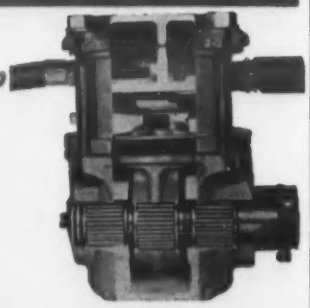
**MODEL 77**

***Diaphragm Descaling Acid Pump***

Descaling compounds can't affect this pump! All parts in contact with compounds are completely acid-resistant. Can be supplied as portable unit with pump and motor mounted on sturdy base and with convenient carrying handles.



*Orders shipped the SAME DAY received.*

***Plus a complete line of centrifugal pumps***

. . . sized to fit your needs. ¼ H.P. thru 10 H.P. Easy to install and compactly built. Advanced features include exclusive baked-on lifetime finish to enhance appearance and resist corrosion, John Crane mechanical seal, and all-bronze one-piece impellers. Continuous duty motor, 1750 rpm or 3450 rpm.

ACE PUMP CORPORATION
140 HERNANDO ST. • MEMPHIS, TENN.

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SEE US AT THE ATLANTIC CITY SHOW...BOOTH 904

CALGON COMPANY
DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.
HAGAN BUILDING, PITTSBURGH 30, PA.
In Canada: Hagan Corporation (Canada) Limited, Toronto

## ECM Agreement Speeds Opening of Brussels Auriema-Europe Hdq.

NEW YORK CITY—The recent European Common Market trade agreement was the effective influence which hastened the opening of Brussels headquarters for Auriema-Europe, S.A., the new Belgian-American company formed by the American corporation, Ad. Auriema, Inc., in joint venture with Ets. N. Blomhof of Brussels, it was announced.

Ad. Auriema, Inc. here has been, since 1921, a principal exporter in the refrigeration, electronics, technical instrument, communications, and industrial control fields, with an active division controlling foreign licensing and patent exploitation, the company pointed out.

The new European company will operate directly with United States manufacturers, as their European sales office, under the guidance of Ad. Auriema and under the direction of N. Blomhof; assisted by several United States-trained graduate engineers in charge of sales.

### Otto Bernz Forms Canadian Subsidiary

TORONTO, Ont., Can.—Otto Bernz Co. of Rochester, N. Y. has formed a Canadian subsidiary, Otto Bernz Co. (Canada) and completed an arrangement with John A. Huston Co., to make Bernz products, it was reported here.

Huston has acted as exclusive sales agent for the American firm for several years. The company makes portable refrigerators, propane-gas-operated blow torches, and other products.

## Cowshed Being Considered In Sweden As Low Temp Heat Source for Heat Pumps

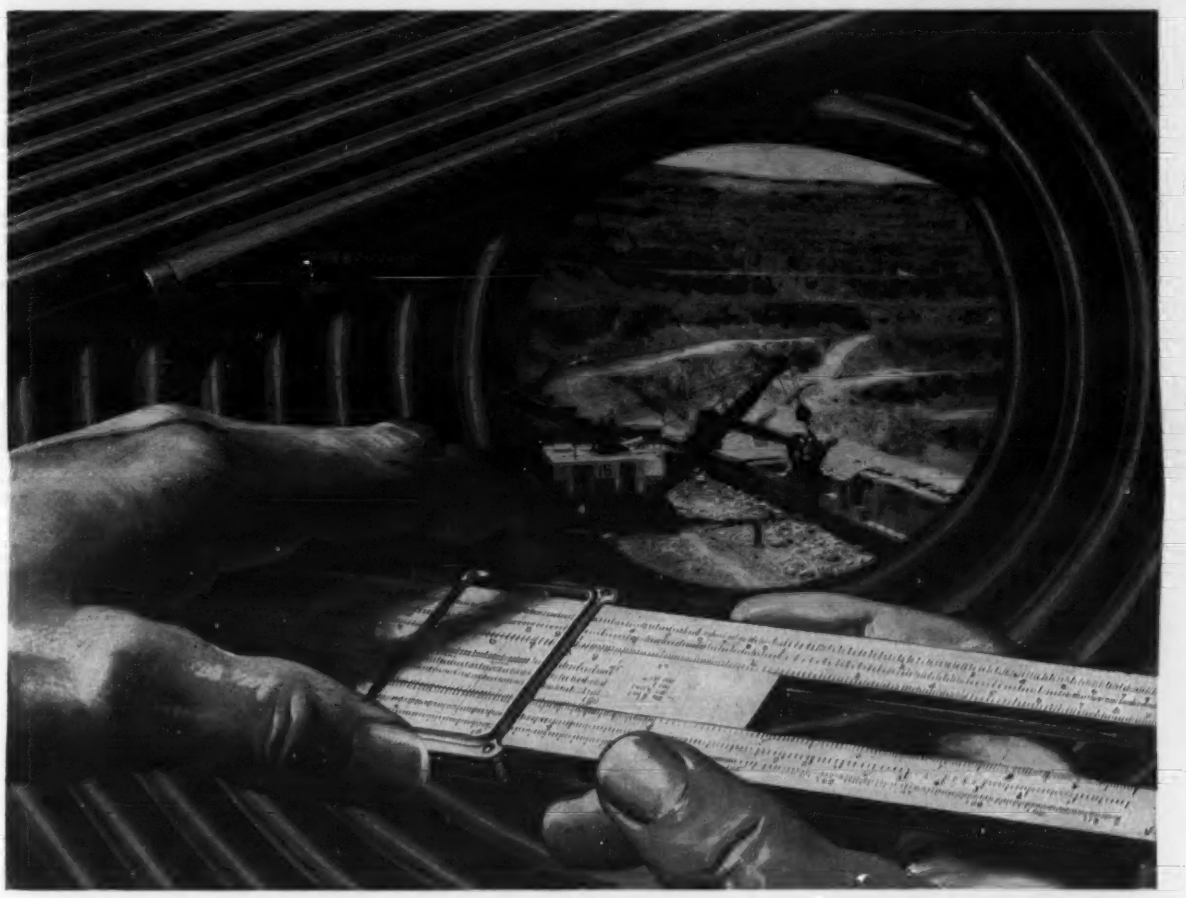
SWEDEN — "Excess heat from the cowshed" is being seriously considered as a low temperature heat source for the operation of heat pumps in this country. Sewer water from larger townships may also provide a heat source.

These unusual ideas because climatic conditions in Sweden preclude the efficient use of winter air as the heat source. More conventionally, ground, sea, and river water have been used allowing evaporator temperatures of about 32° F., although Swedish engineers feel that ground heat collectors will never assume importance.

According to one report, "Heat pumps may never be used for warm water supply. As it is a question of heating through a comparatively wide temperature range, a staged installation, with, for example, three condensation temperature levels, is advantageous. Using a sewer water heat source, a COP of about four may be obtained with warm water temperatures as high as 158° F."

While the rising cost of fossil fuels and more efficient design of equipment may change the picture, "At present it is only economically feasible to use heat pumps in relatively few cases of space heating in Sweden," it is explained.

**NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.**



HERE'S WHY SO MANY ENGINEERS SPECIFY

Phelps Dodge Copper Tube for refrigerating, air conditioning and heating units!

1 Phelps Dodge has complete control of its copper tube from original source to finished product. The copper used in Phelps Dodge tube comes from Phelps Dodge-owned open-pit mines, is smelted in Phelps Dodge refineries and fabricated in modern Phelps Dodge mills. This overall Mine-to-Market control is assurance of highest quality and finest workmanship.

2 Phelps Dodge devotes particular attention, throughout fabrication, to uniform anneal for tube flaring and careful control of die draw for close tolerance.

3 Phelps Dodge can supply maximum tube lengths and precise wall thicknesses engineered to customer specifications; straight length tube tempered to meet bending and expanding requirements.

4 Phelps Dodge multiple mill operation guarantees a steady source of tube supply to meet the needs of manufacturers of refrigerating, air conditioning and heating equipment.

*It's the famous Mine-to-Market Quality Line . . . sold the quality way—through authorized wholesalers!*

PHELPS DODGE COPPER PRODUCTS CORPORATION
New York, N.Y. • Los Angeles, Calif.

PD

*Engineering/ Installer Believes*

# What's There; What Can Be Done with It? Best Approach To Cooling Existing Building

*By Carl Artran, Principal,*
*MainLand Heating & Air Conditioning, Santa Barbara, Calif.*

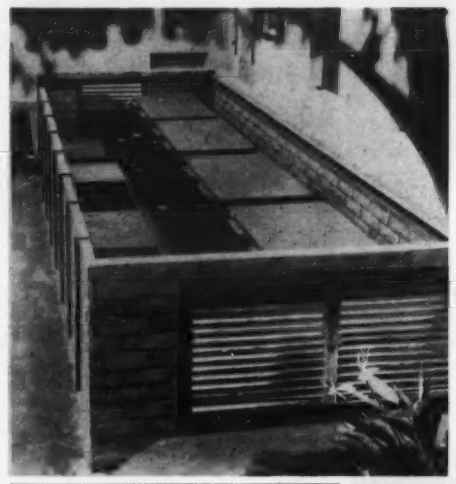
Santa Barbara's picturesque La Rinconada building—today, a midtown office building landmark—was built in 1956 at a cost of approximately $500,000. In architectural design it is in keeping with the tiled-roof, Spanish motif demanded by the city's building code. Incorporated were all the plus features expected of an ultra-modern structure of this sort, with one exception—air conditioning!

The thinking at that time was that you didn't need it in a coastal city like Santa Barbara. After the building's completion, it took several successive major heat waves to prove that air conditioning was a "must" here.

Much time was spent in prospecting the original search for a method of cooling the building. Building owners talked to several air conditioning contractors. Being more merchandisers than engineers, these contractors suggested the installation of a large number of window units. The owners shied away from this idea for aesthetic as well as other reasons, holding out for a thorough analysis of what they had and what could be done.

We felt the solution, as will be described, was definitely better than a plurality of small units as it makes use of all existing equipment and provides a relatively few maintenance points, and all of these in service areas rather than office areas. In addition, it greatly reduced the noise level in the offices of the attorneys, stock brokers, and others who are valued tenants.

MainLand Heating & Air Conditioning started working on the job late last Spring. We finally came up with a design of eight zones in the building; four on the first floor; four on the second floor. The original zoning used in the heating system was followed.



BECAUSE no space was allocated in the original building design for air conditioning equipment it was necessary to design and construct this squat building.

BELOW shows installation of underground steel conduit connecting with main building. Conduit was surrounded by 4 in. of concrete before topsoil was replaced.

Air quantities were set by the original design. The heating and ventilating units were not chosen to accept future cooling coils. The solution, therefore, was to install the cooling coils in each of the eight zoned ducts.

### Squat Building Needed For Cooling Equipment

No space was allocated in the original design of the building for future cooling equipment. Thus it was necessary to design and construct a squat building occupying a slice of the parking area. This building has slumpstone wall at the rear and returning at the two ends. The roof is made of steel roof decking, put in overlapping sections and slide-in steel channels and into a continuous steel channel across the rear of the building so that the roof may be removed in sections.

### Roof Removes for Access to Units

After the roof is removed, access may be had to all of the new eight Carrier air-cooled condensing units housed therein. The front of the building is composed entirely of louvers which are held in place by vertical 4 by 4 I-beams set 3 ft. in concrete and forming matching channels. The four smaller condensing units are placed just behind the louvers and discharge directly through the louvers to outdoors.

The four larger condensing units are placed at the rear of the building and have eight removable air discharge ducts which terminate at the louvers to discharge through the louvers and outdoors.

Remainder of the louver area is for air intake. The structure is 7 ft. wide, 25 ft. long, and approximately 4 ft. high. The four larger zones are served by Carrier model 38, D-11 condensing units, with capacity of approximately 5½ tons each.

There is one zone requiring a 3-ton system, which is supplied by Carrier model 38-E-4 condensing unit. The remaining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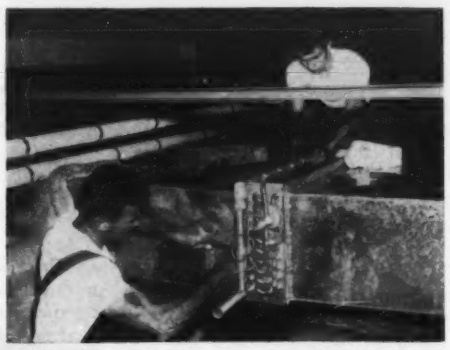
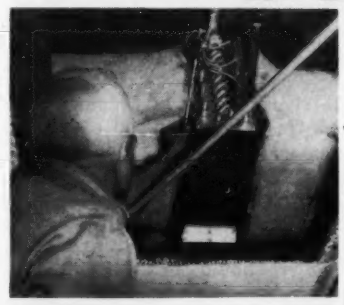
RIGHT: Three of the D-H evaporator coils were installed in the attic.



BELOW: The other four evaporators were installed above the suspended ceiling of the first floor original equipment room in a space used for the return air plenum for the downstairs unit.



ALL EIGHT D-H coils were fitted with special condensate drain pans and each drain was in turn fitted with a second safety pan.

three zones require 2½ tons each, handled by three Carrier model 38-E-3 condensing units.

The equipment building is separated from the main building by about 20 ft. In between, there is a planter. It was necessary to remove all of the tropical plantings and the top soil from this planter and install a steel conduit underground which measured about 5 in. by 25 in. in cross section and which spanned the 20-ft. lengths.

This was prefabricated and taken to the job with a 2-in. electrical conduit installed, as well as the eight liquid lines and the eight suction lines required. After the underground conduit was in place it was surrounded by 4 in. of concerte. Then the top soil was replaced.

The eight Drayer-Hanson evaporator coils with their thermal expansion valves were ordered in exact sizes and some odd shapes to fit the available space. Three of the Drayer evaporators were installed in the attic. One evaporator was installed above the suspended ceiling of the second floor.

The other four evaporators were installed above the suspended ceiling of the first floor original equipment room in a space used for the return air plenum for the downstairs unit.

All eight Drayer-Hanson coils were fitted with special condensate drain pans and each drain was in turn fitted with a second safety pan. To provide the utmost in safety, the drain lines from the primary drain pans and the secondary drain pans are run individually.

The original Barber-Colman temperature control system was of the proportioning type, using eight room thermostats controlling eight pairs of face and by-pass dampers. In addition, there were the necessary outdoor and change-over controls, outdoor air, return air dampers, and motors as well as the controls necessary for the Ajax hot water boiler, the electronic three-way mixing valves, and the Bell & Gossett circulators.

A Barber-Colman engineer revamped the control system using two items which were suitable and adding and interlocking those additional controls required for the cooling phase.

When the control system is completed the operation will be 100% automatic, starting with two Paragon seven-day calendar time clocks.

Remembering that the air quantities available were set by the original system installation, it developed that those zones facing Northwest had too high a solar gain to be handled by the available air quantities. The solution was to install 14 'Koolshade' screens on the 14 windows facing Northwest.

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# Installation & Service Practices In Commercial Refrigeration

One of a group of discussions on several phases of the installation, operation, and servicing of commercial refrigeration equipment.

*By Frank J. Versagi*

## Meat Discoloration (1)

The discoloration of meat in display cases, service cases, and coolers is a chronic problem in supermarkets and smaller food stores. The refrigeration serviceman or refrigeration equipment manufacturer is always called in, since it is quite natural for the store operator to suspect the equipment when his meat changes hue.

And sometimes the refrigeration is at fault.

Just as frequently, and more often than that if you listen to refrigeration people, the cause of meat discoloration is not improper refrigeration. Being realistic, however, most commercial manufacturers feel "Regardless of the fact that in most instances of meat discoloration neither the contractor nor the equipment is at fault, it must be realized that when meat discoloration occurs, refrigeration people will be drawn into the matter."

Then, too, "the younger and inexperienced serviceman may be unaware of the several causes of meat discoloration and aggravate the situation by attempting improper adjustments of the control or expansion valve," bemoans one authority.

In considering the problem of meat discoloration, it must be remembered that all fresh meats will eventually discolor. Indeed, the first noticeable change in color takes place within a few minutes of cutting. Beyond that first change, however, it is desirable to reduce or eliminate any darkening of the meat or fading of cold cuts while the food is on display.

Discoloration may occur for one or more of several reasons: light, heat, contaminants in the air, low humidity. Obviously, refrigeration serves to slow the rate of discoloration due to any of these factors, since the rate of discoloration in any case is always higher at higher temperatures.

A qualification to this general statement is the evidence which indicates that the greatest enemy of meat is **temperature fluctuation**—that it might, for example, be better to have 40° all the time, than a 36° average which fluctuates from 20° to 45°.

Quite a few store operators will recall, when it is pointed out to them, that the modern trend toward well lighted stores has a bearing on their meat discoloration problems, but with many of them this is a point of academic information. When meat discolors, they still blame the refrigerated fixture. For his own defense, the refrigeration man should be familiar with a few fundamentals.

### Amount of Light Affects Discoloration

First, the **amount** of light has a direct bearing on discoloration. One set of figures shows that 50-ft. candles of light on a product tend to raise the product temperature 4-5°, **even though the product may be under a layer of cold air.** It is not unusual to find stores today with 100-120-ft. candles of over-all illumination.

### Type of Light Important

Second, the **type** of light—whether sunlight, incandescent, or fluorescent—has a bearing on discoloration. And of most practical significance for the modern store, the type of fluorescent bulb is important. Recommendations call only for "soft white" or "Deluxe cool white" in the refrigerated fixture. When lighted, these tubes give off a pinkish cast and causes the slowest product color change of any fluorescent lamp, according to one source.

These special fluorescent lamps should be used in the meat case and for general store lighting in the area of the meat department. While correct lighting may be installed with the equipment when the store is opened, it is not unusual for replacement bulbs to be of the wrong type.

### Meat Should Be Turned Over at Intervals

Third, taking these known facts into consideration, store personnel should make it a point to turn meat over, re-lay the display, change position of the product where customer traffic is not heavy enough to prevent some areas of the display from laying dormant.

Heat as a factor in meat discoloration obviously includes a refrigeration system which is not performing properly. And sometimes an adjustment may be called for. In a case, designed for, say, 26° supply air and 32° return air, a serviceman or store operator may feel that running the supply air colder will improve storage life. Yet as the supply air temperature is dropped, the spread or differential across the case increases, and the difference may reach the point where the product is freezing at the back of the case, is


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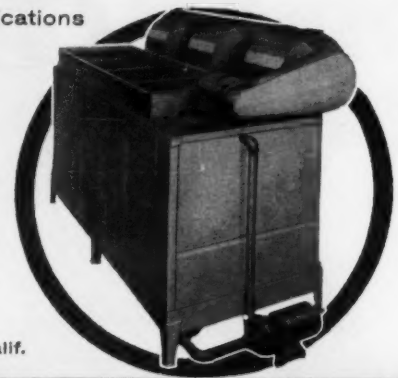

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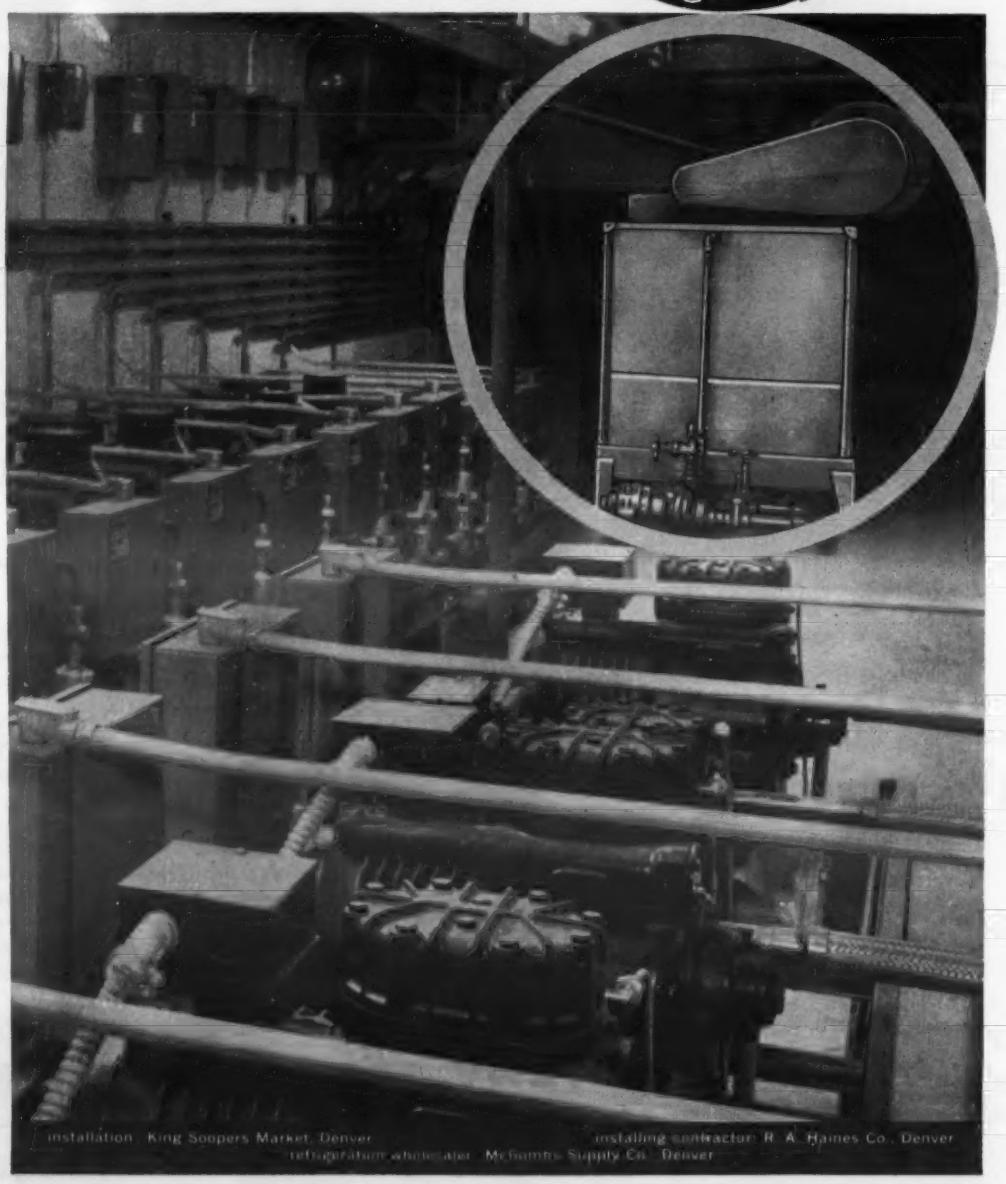

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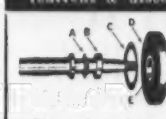


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warm at the front. And excessive sweating may occur on the off-cycle.

Here again, education is needed. One major chain now gets 4-5 days of case life from its meats where it used to get two. The difference — running the supply air on these particular cases at 30°, rather than its customary 24°.

### Some Stores Put Warm Products In Cases

There are other problems with heat. One of the major complaints of fixture manufacturers is that store personnel expect cases which have been designed to **hold** product temperatures to **pull down** the temperature of a very warm or even hot product. As an extreme example of this fault, one manufacturer reports a user who expected a bottle cooler to cool and hold 1,000 lbs. of hot chili a day!

More realistically, three or four hours may pass before the retail cuts taken from the wholesale meats are placed in the service case, and these hours are not always under proper temperatures. Condensation on the meat when the meat is taken from a cooler into a warmer cutting room may affect color.

### Heated Wrappings Proved a Problem

In one store a major discoloration problem on packaged meats was solved when it was discovered that wrapping clerks were passing the wrapped packages so slowly over the sealing machine that the underside of each package was scorched. Then packages were piled on each other, holding the heat in.

Some store owners tend to cut and package meat during idle periods for sale and display during peak periods of customer traffic. Sometimes days will pass before the packages actually reach the display cases, where they may then discolor if they are not sold quickly. One commercial manufacturer instructs salespeople and servicemen to learn the package code used by the meat department so they can determine when meats were packaged, not merely when they went in the fixture.

It is difficult to get agreement on proper fixture temperatures for various products. Some installations display meat successfully at 44°; others at much lower temperatures. One authority suggests, "The lowest uniform temperature that can be achieved without freezing the meat and still operate the refrigeration unit on defrosting cycle is the most desirable temperature for a walk-in cooler. An experienced meat man may call for higher cooler temperatures which, for him, "maintain the feel of the cuts."

So the installer and serviceman are faced with the problem of fitting a fairly standardized piece of equipment into the needs and desires of a specific customer—something which the design of most cases allows with reasonable facility.

*(To Be Continued)*

## NILFP Moves Offices To Modern Quarters

ELIZABETHTOWN, Pa. — Offices of the National Institute of Locker & Freezer Provisioners have been moved from 113 N. Market St. to larger and more modern quarters at 224 E. High St.

The move will not affect addressing of correspondence to headquarters as mail will still be received at Box 88, Elizabethtown, Pa., it was pointed out.

### Wrigley Opens Test Market

HAZEL PARK, Mich. — New merchandising ideas are being tested by Wrigley's Stores division of ACF-Wrigley in a 40,000-sq. ft. Big Valu supermarket set up as a separate operation. Among features are a service meat counter and a large produce department.

## Warren Hosts Distributor Organization

ATLANTA—The Warren Co., commercial refrigerator manufacturer here, recently played host to its national distributor organization during a three-day meeting. Approximately 225 attended.

The company's district managers, located in key cities throughout the United States, met for two days prior to the national convention.

The event opened with a buffet dinner given by Warren President J. D. Harris, and the first general meeting session opened the following morning. The program featured the sales advantages provided by the new Warren "Super Sixties Series," now in full production at the company's Atlanta plant.

Several of the company's key distributors made individual presentations and participated in panel discussions. Models and actors were used for "typical situation" dramatizations to present new models and new features.

One of the luncheon speakers was the company's export manager, Albert Rebel, of Los Angeles, who spoke on "Warren Around The World."

At the concluding banquet, members of the company's Top-Ten Club were honored. Roger D. Jacobs, Warren's executive vice president and sales manager, directed the affair.

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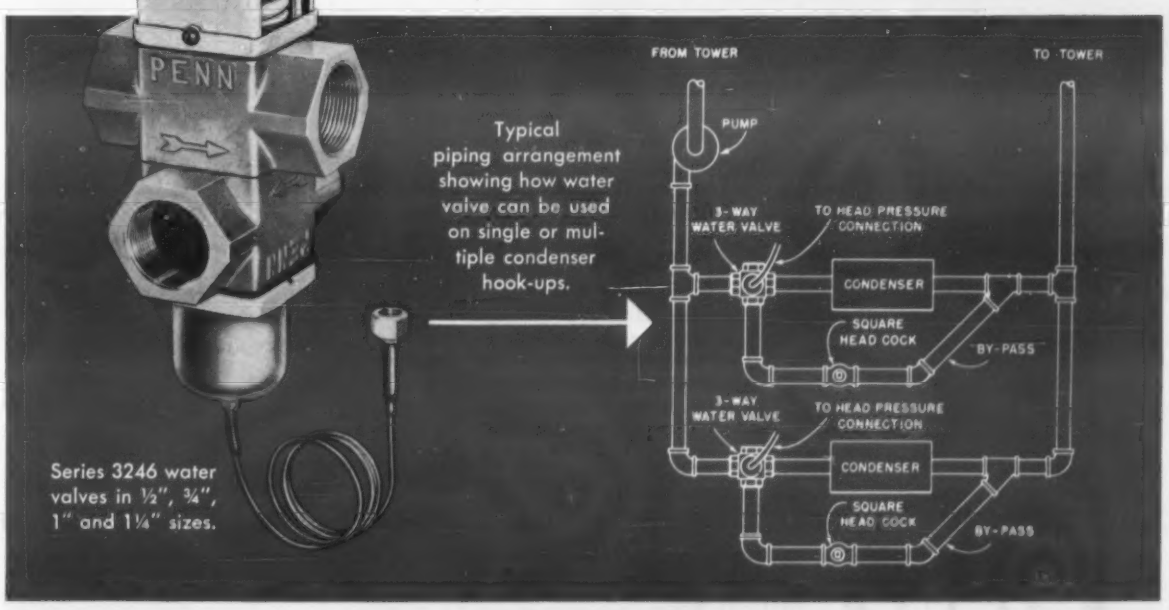


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*Has Ice Broken?*

# Competition by 4 Conditioned Office Bldgs. May Boom Big Commercial Market In Cleveland

*By C. Dale Mericle*

CLEVELAND — Reluctance of owners of downtown office buildings here to provide air conditioning for their tenants is undergoing a sharp re-appraisal.

Within the past year four completely air conditioned office buildings have entered the competition for tenants, so the owners of other buildings are being forced to reconsider air conditioning as a means of holding their occupants.

When East Ohio Gas Co. moved into its new air conditioned skyscraper, it not only offered several floors of rental space in the new building but threw its former building, also air conditioned, onto the market.

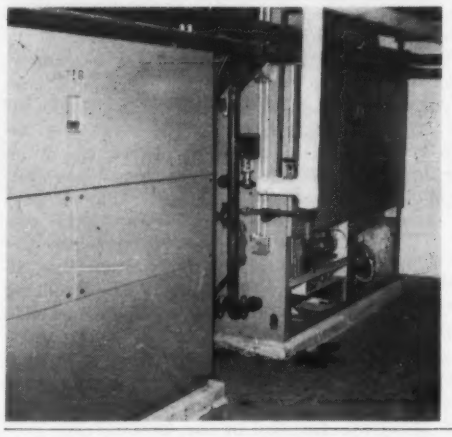
Similarly, Cleveland Electric Illuminating Co. moved its headquarters into a new, air conditioned building having plenty of office space to rent, and the building it formerly occupied, now called 75 Public Square, has been completely air conditioned—in a somewhat unusual way that will be described in detail.

"Operators of office buildings who wouldn't even discuss air conditioning in years past are now very much interested in finding out how it can be done in the most practical way," points out Warren W. Farr, president, Refrigeration Sales Corp. here.

"They're fearful of losing tenants to some of the new air conditioned buildings, and the competition is rough," Farr indicates.

For example, one of the new buildings has offered to pick up the tab of "highly desirable" tenants with a year to go, say, on their present leases, if they'll move. While this doesn't save any rent for such tenants, it likewise doesn't cost them anything to break the lease.

Effects of this market development and competition may very well be seen in action taken by the older Union Commerce building, which is still the largest office building in downtown Cleveland and is considered by many to be the most desirable address.



IDENTICAL machinery rooms on five floors of Cleveland office building each house two 10-ton Carrier package units which supply year-round air conditioning to two zones on each floor.

When one of its largest and most respected tenants early this summer indicated it was interested in air conditioning, management of the building had 100 Carrier year-round type console air conditioners installed by Refrigeration Sales Corp. in these offices in less than 30 days, which must be something of a record.

Air conditioning of 75 Public Square, which was also handled by Refrigeration Sales, a Carrier distributor, was unique in several respects.

For one thing, the entire 15-story building was vacated in a three-day period when the electric utility moved across the street to its new quarters. Thus the contractor had the unusual opportunity of installing equipment in an existing building that was totally unoccupied.

By the same token, however, the contractor had to estimate loads and design the system with no exact knowledge as to the ultimate type of occupancy, which meant considerable flexibility was essential. It was not known, for example, where office partitions might be, so this contingency had to be considered.

It was also a unique experience for Refrigeration Sales in that the firm was the prime contractor on the building remodeling job, for all practical purposes. Of the approximately $800,000 being spent in remodeling the structure, more than 35% is chalked up to air conditioning. Besides air conditioning, the building remodeling program involves a new front at street level, partitions, and renovation of elevators, plumbing, wiring, etc.

Basic design principles for air conditioning had been worked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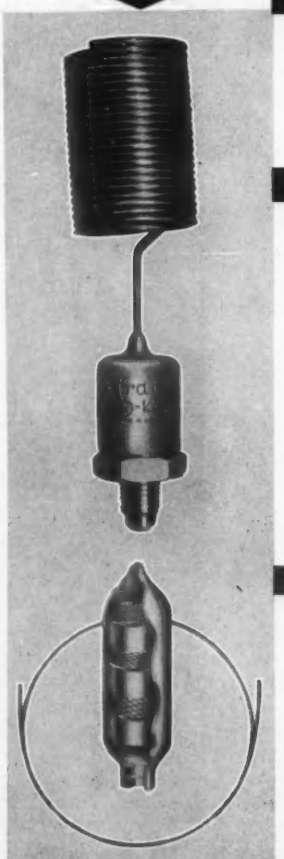

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out by Constantini & Associates, consulting engineers for Trebor Realty Corp., which purchased the building and is now managing it.

Bid submitted by Refrigeration Sales was some $60,000 below the lowest of the other bids, which came from conventional mechanical contractors.

This big difference, according to Warren Farr, was not due to cutting corners but resulted from the fact that his firm is an air conditioning and refrigeration specialist and devoted nearly three weeks to studying every detail of the building before submitting a bid. Mechanical contractors bidding on the job spent three days at the most going over the site, he found.

A big saving was achieved in rigging costs alone. Careful measurements indicated that all the equipment could be taken up in elevators instead of being rigged up the outside of the building. This was no great problem for the 14 10-ton Carrier central station package units, but the four 20-ton Carrier units and the 250-ton Lillie-Hoffmann cooling tower had to be partially dismanted to fit the elevators.

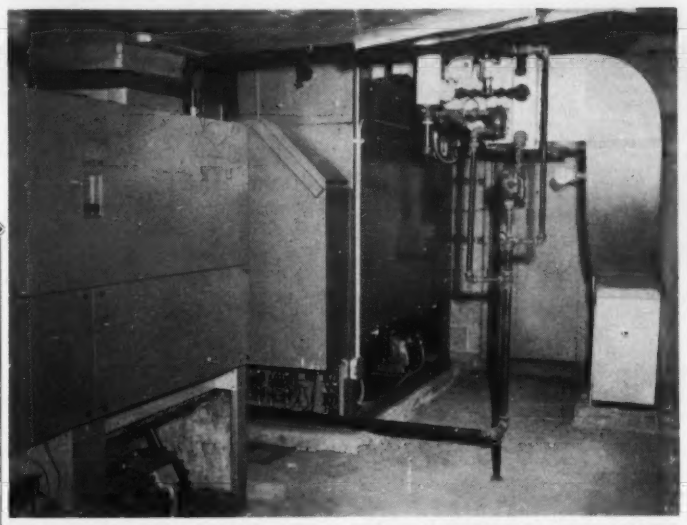
Although the 20-ton Carrier units are not designed to be so cut apart, the main frame can be split into two sections with little difficulty, Farr explains. It was necessary, however, to cut the liquid and suction lines of the units and then replace them when the units were in place.

Basic design of the system for 75 Public Square calls for two 10-ton units for each floor, each serving one of two zones. The rectangular shaped building is laid out along a North-South axis. One zone consists of the South end and West side; the other includes the North end and East side. Most of the floors have 6,642 sq. ft. of rentable area.

Systems installed by Refrigeration Sales actually involved air conditioning for 11 of the building's 15 floors. At a previous time the first two floors had been pretty much air conditioned, but the firm added to and modernized these systems. The 11th floor, which consists of a series of executive suites, had previously been air conditioned and was not touched.

Identical equipment rooms, each housing two 10-ton units—one for each zone—are provided on floors 6, 7, 8, 9, and 10. (There are two other equipment rooms that will be described later.)

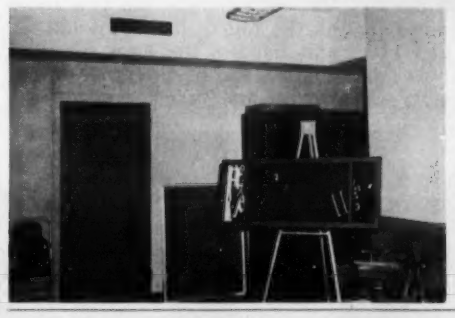
These five rooms each measure 10 by 20 ft. and are on an outside wall. Window openings here have been bricked up, but provision is made to bring outside air through the wall to the units.



SIX FLOORS of same Cleveland office building are served by equipment in two machinery rooms. In each room are two 10-ton units for one floor and two 20-ton packages for two more floors. In this photo a 10-ton unit is at left, 20-ton conditioner at right.

MACHINERY ROOM was built over 3-story section of building to house air conditioning equipment handling three floors.

ALL EQUIPMENT was installed at same time, but duct connections at machinery rooms were stubbed out until office space was leased, thus permitting air distribution to be tailored to tenants' needs. Here the Warren Farr's—Jr. and Sr. —of Refrigeration Sales, inspect a system at this stage.



REGISTERS on side of trunk duct, furred down in this instance, supply air for larger conditioned spaces.

All the new Carrier units in the building are equipped with "Economizer" controls, which permit 100% outside air to be circulated through the system without operating the condensing units when the outdoor temperature is in the right range. A minimum of approximately 25% outside air is supplied at all times.

Steam coils in the units permit year-round air conditioning.

Operation of these 10-ton units on cooling is controlled by a single thermostat in each zone. A second thermostat in each zone controls the heating. Barber-Colman controls are used throughout.

While winter heating is provided by the air conditioning system, existing cast iron radiators recessed beneath the windows have been retained and

*(Concluded on next page)*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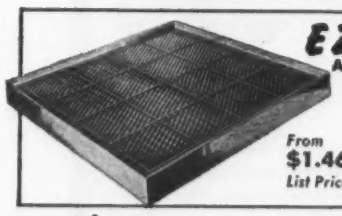

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RP *Products of Research*

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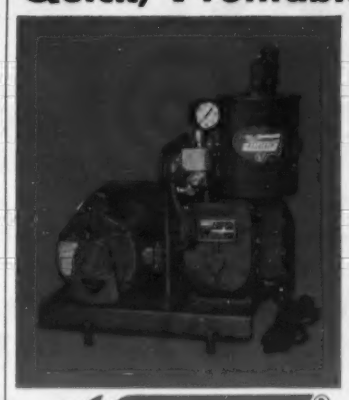

**Kinney® FEATURES TWO NEW PORTABLE HIGH VACUUM PUMPS**

KINNEY KC-3R and KC-8R Portable High Vacuum Pumps are proving important money-makers for servicing Freon Refrigeration and Air Conditioning Systems up to 10 ton size. These gas-ballasted KINNEY Pumps leak test, evacuate and dehydrate the system *quickly*. They're built for rugged day-in-and-day-out service and, being portable, are always ready... in the shop or out on the job. Get the advantages of these KINNEY Pumps for your service operations — write for prices today.

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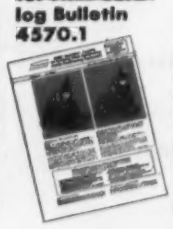

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# Cleveland Bldgs.

*(Concluded from preceding page)*

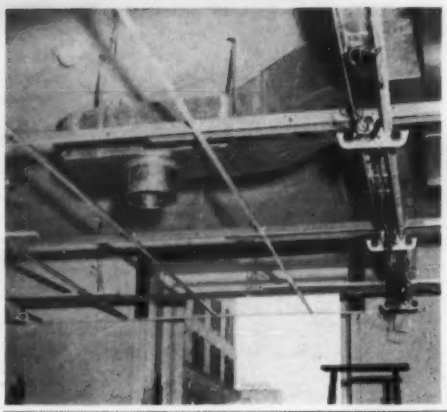
will be used for perimeter heating. Front of the radiators, however, is concealed by a simple but attractive masonite sheet with openings at top and bottom for convection.

Additional saving in installed cost, besides opening up more rental area, was achieved by the contractor's suggesting a departure from original plans.

Instead of two 10-ton units for each floor, why not install two 20-ton units handling two floors?

A 20-ton unit, of course, costs less than two 10-ton units, and it was so worked out that no rentable space had to be blocked off for machinery rooms on floors 3, 4, 5, 12, 13, and 14.

One equipment room was built on the roof of a three-story section at the rear of the building, being level with the fourth floor. In it are two 10-ton conditioners and two 20-ton units. The 10-ton units handle the two zones on the fourth floor. One 20-ton unit handles the East zones on floors 3 and 5; the other 20-ton conditioner takes care of the West zones on floors 3 and 5.



IN SMALLER offices ceiling is dropped, permitting flush-mounted ceiling diffusers to be employed.

Control setup for the 10-ton units is the same as for those on other floors, but a different arrangement is provided on the 20-ton units, which, however, also use the Economizer control for outside air.

Reheat and a two-step thermostat are employed with the 20-ton units, each of which has two 10-ton compressors. The two-step thermostat, responding to discharge air from the unit, cuts in one or both compressors as needed for cooling.

Steam reheat coils are installed in the main supply ducts to each zone on each floor, and these are controlled by zone thermostats which also control the same coils for winter heating.

Reheat was considered advisable for the units handling two floors because one zone on one floor could require cooling at the same time the corresponding zone on the other floor didn't need cooling or possibly required some heating. These circumstances obviously could prevail as the result of different types of occupancy on the two floors.

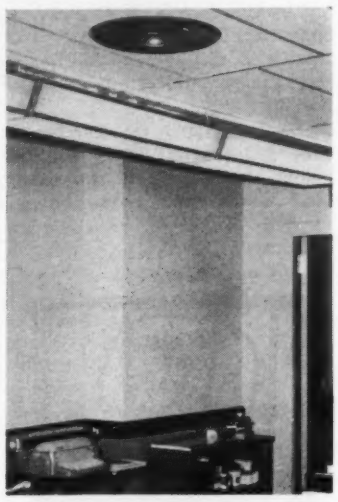
An identical selection of equipment and controls is provided in the equipment room on the 15th floor where two 20-ton and two 10-ton units provide year-round air conditioning for the 12th, 13th, and 14th floors.

## Packaged Units Proved Most Practical

At first thought, using so many package units for an installation of this type in 75 Public Square might seem impractical, but the opposite is true.

As previously mentioned, when air conditioning was being designed and installed, there was no exact knowledge of the type of occupancy. More important, though, was the predictable fact that not all of the space would be rented and occupied at the same time by a single tenant. Actually, the space has been rented more on a floor by floor basis, and in many instances only part of one zone on a floor would be rented and occupied at a time.

Had a single central system been installed for the building, it would have been impractical to operate it just for a few tenants scattered throughout the building in the early stages. Even now, in fact, the building is not 100% rented.



COMPLETED INSTALLATION of ceiling diffuser in smaller offices looks like this.

The approach used, however, permitted all the machine rooms and equipment to be installed at one time, but the supply ductwork was not installed until at least some space had been leased. Thus, the ductwork could be tailor-made to the renters' requirements.

Ductwork design has varied with occupancy. For large open areas such as general offices, a drafting room, and the like, registers are installed in the side of a trunk duct (at ceiling height), which is fully exposed in some instances, furred down in others. For smaller offices the usual procedure has been to drop the ceiling and install ceiling diffusers.

This piece-meal occupancy and ductwork installation has required extra thought and care in balancing the individual zones, but thus far has presented no unusual difficulties, according to Warren W. Farr, Jr., supervising engineer.

There have been instances, however, when the first occupants on a floor were in a space other than that where the zone thermostat is located. When that situation has occurred, a temporary register or two has been placed in the duct at the thermostat area so control can respond in normal manner.

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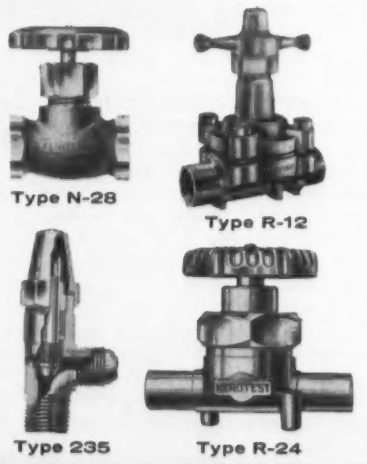


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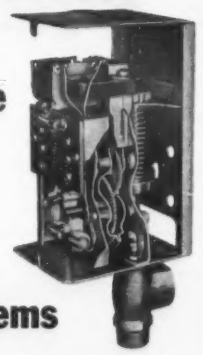

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*From the Manufacturers*

# Service Bulletins

In this department, the NEWS presents significant items from information published in the Service and Technical bulletins of manufacturers.

The ferrule holes of many new cases are insulated with the foamed-in-place polyurethane plastic. For a plastic material, polyurethane has a very high melting point. However, it will deteriorate under exposure to a torch even though it does not support combustion.

With the most indiscriminate use of a torch, the seal between the insulation and the case will be preserved, assuring the customer of completely dry insulation.

**Tyler Refrigeration Corp.**

**Carrier Corp.** is expanding the use of the lock-out circuit, particularly on its residential equipment. Use of this circuit eliminates the starter reset button and permits the customer to restart the equipment from the thermostat after an overload. This provides greater convenience to the customer and permits greater flexibility in location of electrical components within the air conditioner equipment.

* * *

Since the original printing of the radial compressor service manual and the packaged unit service manual, certain manufacturers' oils have been made unacceptable through changes in the oils and through the use of R-22 in Airtemp compressors.

The only two oils presently approved for radial compressors and packaged unit compressors, both R-12 and R-22, are Texas Co.'s Texaco Capella-D and Sun Oil's Suniso-4G.

**Airtemp SERVICE SLANTS**

Questions are raised frequently concerning hazards or damage to equipment which could result from installation of an evaporator in the heated air from a furnace. Most of this concern is over pressures which might result from heat being applied to refrigerant in the evaporator or to heat damaging an expansion valve.

Problems are avoided with the expansion valve by the use of a gas-charged thermostatic element. Actually the gas-charged element of this valve does contain liquid at times during its operation; however, the total charge it contains is limited in amount such that at the relatively low temperature of the bulb, all of the liquid will have evaporated. When all the liquid has evaporated, any increase in temperature can only superheat the vapor without a significant pressure increase.

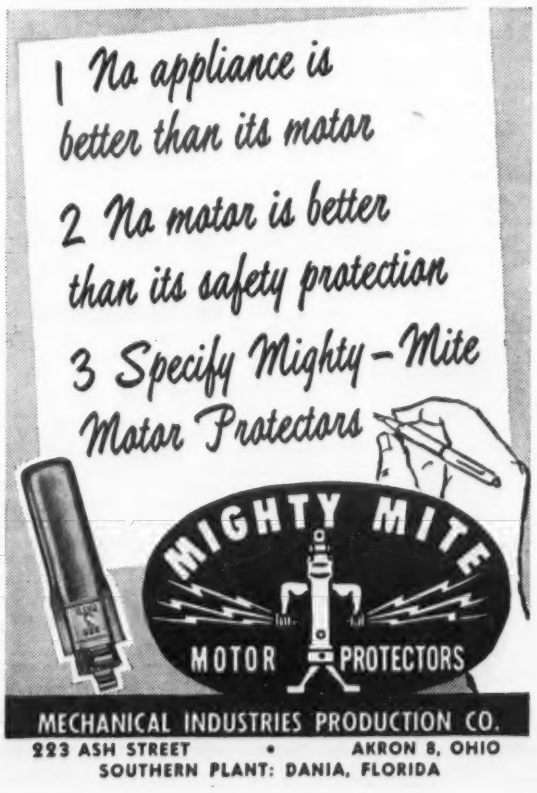
With a furnace limit control setting no higher than 250°, no damage will result from the valve's being in the heated air.

Looking at split units, assume the liquid refrigerant exists in the evaporator after air conditioning shutdown and furnace startup. Application of heat will cause the refrigerant to boil and will raise the pressure. A slight increase in pressure will cause the resulting refrigerant vapor to flow through the suction line to the compressor sump. Since the compressor is outdoors and cooler, this vapor will condense.

Actually under these conditions, the expansion valve will open and let refrigerant flow to the condenser through the liquid line.

If the system contains enough refrigerant to cause difficulty if it all went to the compressor, crankcase heaters are required.

When all the liquid refrigerant has left the evaporator, the system pressure will approach saturation pressure for the temperature of the liquid refrigerant which is in the outdoor part of the system. It is evident, therefore, that hazardous pressures will not result when the evaporator of a split system is located in the hot air stream from a furnace.—**Janitrol INSTALLER**



1 No appliance is better than its motor
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# New Rigid Foam Sprays on Tanks, For Protective Coating, Insulation

TOLEDO — Important advances in the fields of insulation and corrosion control — and many other fields—are foreseen as a result of a new development in sprayed rigid polyether-based urethane foams.

The new foam was developed by Wyandotte Chemicals Corp. The techniques and equipment for spray application were worked out by The DeVilbiss Co. here. DeVilbiss can make available the necessary spray equipment and will demonstrate the new foam application.

The rigid foam which results from this new development is self-adhering and can be sprayed on a vertical surface without sag or runs, using appropriate spray equipment with a DeVilbiss catalyst spray gun, it was stated. The new development, DeVilbiss engineers claim, greatly reduces the cost of the equipment required.

"Tests of the new rigid foam have shown savings in time, labor costs, and material of up to 75% in some critical installations," the DeVilbiss announcement said.

### Kelvinator Sales Up

DETROIT — Sales of Kelvinator major appliances in September jumped nearly 47% over the same month of last year and total volume on major products was the highest in nearly three years, according to Homer L. Travis, vice president in charge of sales. Refrigerator volume, one of the highest in recent years, was up 52%.

**Reduces Some Prices**

## *Frigidaire Expands Warranty In Britain*

LONDON, England — A. W. Porter, director and general manager of the Frigidaire organization in this country, reported recently that the five-year warranty on the company's refrigeration compressors would now be extended to cover motors on condensing units.

Porter also announced that prices of frozen food display cabinets manufactured by Frigidaire have been "materially reduced" and cuts of up to 10% have been made in a number of other commercial refrigeration accessories. He said that the company is producing at an annual rate 50% above 1956 and that its exports of low temperature cabinets had risen by 26% since last year.

Leaves more useful shelf space available in reach-ins, back bars, and under-counter cabinets because it has an *extremely flat, thin silhouette of only 4½".*

OTHER TOP-AIRE FEATURES ARE:

- **Angled fitting so drain can be run through back or bottom of cabinet**
- **Knockouts in top, plus opening in rear, for bringing out connections**
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- **Life-lubricated, impedance-protected motor**
- **Attractive grained aluminum cabinet.**

Available in three capacities: 1000, 1300 and 1700 BTU/hr at 10° T.D. based on entering air temperatures. For complete information, write for BULLETIN No. 80.

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# Heat Pump Heating-Cooling Capacities, Air Requirements Discussed by F. J. Reed

*By Frederick J. Reed, Chief Engineer*
*Air-Conditioning & Refrigeration Institute*

**RAPID increase in heat pump sales has emphasized the need for workable and significant standards in this field. In these articles, William L. McGrath, chief engineer of Carrier Corp. and Frederick J. Reed, chief engineer of ARI, discuss heat pump performance and existing standards.**

Decision by the Unitary Air-Conditioner Section of the Air-Conditioning & Refrigeration Institute to initiate a certification program for unitary heat pumps on the same basis as the existing highly successful certification program for unitary air conditioners, serves to emphasize the advances made by the heat pump in recent years, although the public should be made aware that it is not the answer to all heating and cooling problems.

Heat pumps may be classified under three categories: 1) Room units — non-engineered; 2) Unitary (packaged unit) — semi-engineered or engineered; 3) Field-assembled units — usually engineered.

Room units are available in sizes up to so-called 2 hp.— about 20,000-22,000 B.t.u.h.—on the cooling side, and, with the aid of strip heaters, up to 10,000 B.t.u.h. at 0° F. on the heating side. Some are provided with humidifiers for winter operation.

Field-assembled systems are in use, ranging from large building installations to two-story stores, bowling alleys, and other relatively small applications, all with a wide variety of equipment variations and refrigeration cycle arrangements.

For residential and small commercial installations — and increasingly for larger installations — the majority of heat pumps are air-to-air.

It is not generally understood that for most localities in the U. S. it is not feasible to select the unit on the basis of carrying the heating load entirely by the refrigeration cycle. In most instances, this procedure would not only result in a unit much too large for the summer requirement, but at the same time too costly to compete with other alternatives. Such a unit would, also, complicate operation of the summer cycle.

It is more logical to select, on an economic analysis, a heat pump which will provide the maximum summer cooling, and the best possible heating in winter, which will usually result in a balance point roughly near the average winter temperature in more northern locations, and ranging down to the winter design temperature in our most southerly locations.

Electric strip heaters, are then included in sufficient capacity, and applied in steps, to carry the heating load at lower temperatures.

Since most installations require the use of supplementary heat at lower outdoor temperatures, one problem in the design of unitary equipment is the method of combining economically the heat obtained from supplementary electric strip heaters with the heat derived directly from the cycle itself.

* * *

### *Table 1—Typical Heat Pump Data At Various Conditions*

| Make, No. | Description | Outdoor Temp., F. | Heating, B.t.u.h. Cycle | Heating, B.t.u.h. Total | Cooling, B.t.u. Total | Cooling, B.t.u. Sensible | C.f.m. Indoor | Air Outdoor |
|---|---|---|---|---|---|---|---|---|
| I | Horizontal (attic) | 0 | 4,460 | 29,780 | | | | |
| | Self-contained | 15 | 6,960 | 32,280 | | | | |
| | †8 kw Resist. Heater | 30 | 10,960 | 36,280 | | | 780 | .. |
| | 2-hp. Compressor | * 45 | 16,260 | 41,580 | | | | |
| | Air to Air | *95,75 | | | 18,500 | 13,200 | | |
| I | Horizontal (attic) | 0 | 9,800 | 61,000 | | | | |
| | Self-contained | 15 | 18,300 | 52,500 | | | | |
| | 3 - 5 kw Strips | 30 | 26,900 | 44,000 | | | 1,200 | .. |
| | 3-hp. Compressor | * 45 | 35,400 | 35,400 | | | | |
| | Water to Air | *95,75 | | | 33,000 | 24,000 | | |
| I | Horizontal (attic) | 0 | 9,800 | 61,000 | | | | |
| | Self-contained | 15 | 18,300 | 52,500 | | | | |
| | 3 - 5 kw Strips | 30 | 26,900 | 44,000 | | | 1,200 | .. |
| | 3-hp. Compressor | * 45 | 35,400 | 35,400 | | | | |
| | Air to Air | *95,75 | | | 33,000 | 24,000 | | |
| VI | Split Unit | 0 | 16,000 | 39,550 | | | | |
| | Self-cont. avail.) | 15 | 20,400 | 36,100 | | | | |
| | 3 - 2.3 kw Strips | 30 | 24,700 | 40,000 | | | 1,000 | 1,850 |
| | 3-hp. Compressor | * 45 | 30,000 | 30,000 | | | | |
| | Air to Air | *95,75 | | | 28,300 | 21,200 | | |
| VI | Split Unit | 0 | 19,000 | 42,550 | | | | |
| | (Self-cont. avail.) | 15 | 25,600 | 41,300 | | | | |
| | 3 - 2.3 kw Strips | 30 | 32,300 | 40,150 | | | 1,200 | 2,200 |
| | 4-hp. Compressor | * 45 | 38,500 | 38,500 | | | | |
| | Air to Air | *95,75 | | | 34,000 | 24,800 | | |
| III | Split or Self-Cont. | 0 | 12,500 | 53,500 | | | | |
| | | 15 | 19,100 | 47,000 | | | | |
| | 3 - 4 kw Strips | 30 | 28,600 | 42,300 | | | 1,200 | 2,830 |
| | 3-hp. Compressor | * 45 | 39,100 | 39,100 | | | | |
| | Air to Air | *95,75 | | | 34,800 | 24,400 | | |
| IV | Split Unit | 0 | 17,200 | 51,200 | | | | |
| | | 15 | 23,500 | 46,000 | | | | |
| | 3 - 3.33 kw Strips | 30 | 30,500 | 41,800 | | | 1,200 | 2,300 |
| | 3-hp. Compressor | * 45 | 38,000 | 38,000 | | | | |
| | Air to Air | *95,75 | | | 36,000 | (27,000) | | |
| II | Split Unit | 0 | 25,600 | 49,150 | | | | |
| | (Self-cont. avail.) | 15 | 33,100 | 48,800 | | | | |
| | 3 - 2.3 kw Strips | 30 | 39,400 | 47,250 | | | 1,600 | 2,880 |
| | 5-hp. Compressor | * 45 | 52,000 | 52,000 | | | | |
| | Air to Air | *95,75 | | | 48,000 | 36,500 | | |
| III | Split or Self.Cont. | 0 | 21,500 | 82,500 | | | | |
| | | 15 | 32,500 | 73,500 | | | | |
| | 3 - 6 kw Strips | 30 | 45,200 | 68,700 | | | 2,000 | 4,650 |
| | 5-hp. Compressor | * 45 | 59,400 | 59,400 | | | | |
| | Air to Air | $95,75 | | | 54,000 | 37,800 | | |
| IV | Split Unit | 0 | 30,200 | 70,700 | | | | |
| | | 15 | 44,000 | 71,000 | | | | |
| | 3 - 4 kw Strips | 30 | 58,000 | 71,500 | | | 2,600 | 4,900 |
| | 7-hp. Compressor | * 45 | 71,500 | 71,500 | | | | |
| | Air to Air | *95,75 | | | 72,500 | (48,000) | | |

†Resistance in or out, one step; room thermostat, 2° differential.
*ARI Standard 240-57: Outdoor Standard Rating Temperatures.


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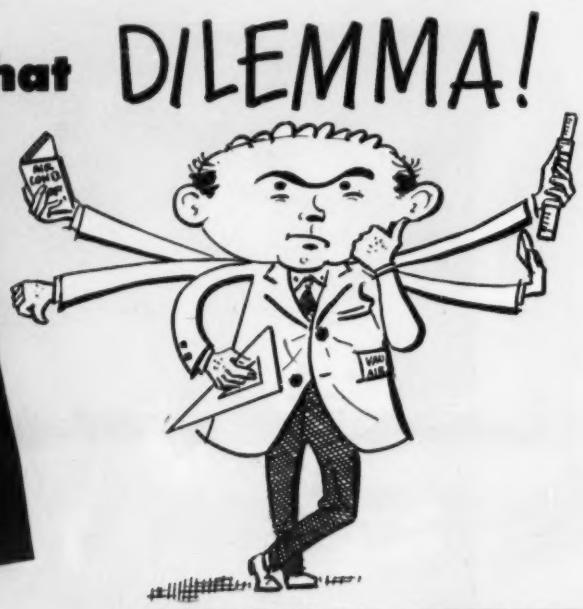

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Rotalock valves feature the highly effective Teflon Fiber Seal for more positive sealing at all times.

Seal may be used over and over without affecting its sealing properties.

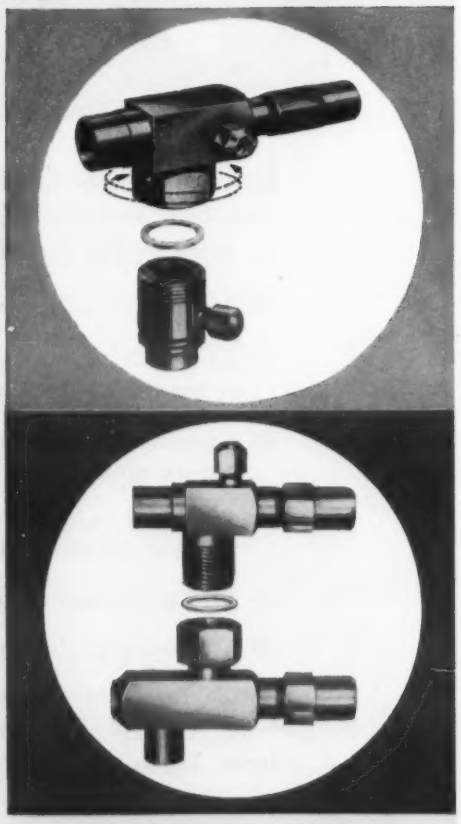
Connector Sizes: ⅜, ½, ⅝, ¾, ⅞, 1⅛ and 1⅜ in.

**BREAK-AWAY** valves assure a fast, positive connection of tubing from evaporator to condenser unit. Evaporator, condenser and interlocking tubing can be completely pre-charged, eliminating all field installation problems.

Straight and angle, sweat or flare, adapters available if pre-charged tubing is not desired.

All couplings feature a Teflon Fiber Seal for best sealing qualities available.

Connector Sizes: ⅜, ½, ⅝, ¾, ⅞ and 1⅛ in.



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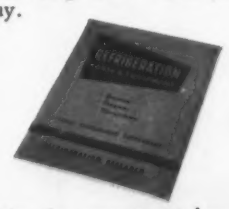

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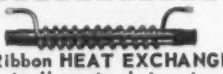

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Table 1 presents data showing how this has been done for a variety of units by four leading manufacturers. The table has been arranged to bring together units of comparable size, and at the same time to cover most of the range commonly encountered in residential and other unitary installations. Larger installations frequently use this same equipment in multiple-unit combinations.

The table is intended to indicate how the heating capacity from the refrigeration cycle alone, and the total heat obtained from the cycle and from the manufacturers' *standard* provision of strip heaters, vary with temperatures down to 0° F. It is assumed that no strip heat will be used at 45° F., that ⅓ of the provision will have been cut in at 30° F., ⅔ at 15°, and all of it at 0°. One exception is noted.

To the extent that the information is available, air flows through the indoor and outdoor units are shown.

Note that the range of air flows (at standard rating conditions) is:

Evaporator air: 400-520 c.f.m./ton (higher than conventional summer air conditioners, to permit more strip heat without excessive air temperature).

Condenser air: 720-1,030 c.f.m./ton.

The table also compares the heating capacities with the cooling capacities. Note here that total cooling capacity under standard rating conditions, and cycle heating capacity are equal in the vicinity of 45° F., the standard rating condition for heating.

Standard rating conditions are established for this type of equipment by ARI Standard 240-57 for Unitary Heat Pump Equipment, to which the Air Force and other Federal government agencies are now referring in their specifications; most manufacturers publish Standard Ratings at the conditions established in this standard, and it is upon this publication that the inclusion of heat pumps in the ARI Unitary Certification Program will be based. Standard 240-57 in turn refers to ASRE Standard 16-56 Methods of Testing and Rating Air-Conditioners for capacity testing procedure.

Parenthetically, it should be pointed out that ASRE Standard 16-56 is in process of being broken up into four proposed new Standards, which will be known as:

ASHRAE Standard 16R — Method of Testing for Rating Room Air-Conditioners.

ASHRAE Standard 37P — Methods of Testing for Rating Unitary Air-Conditioning Equipment.

ASHRAE Standard 39P — Methods of Testing for Rating Unitary Heat-Pumps for Air-Conditioning.

ASHRAE Standard 40P — Methods of Testing for Rating Heat Operated Unitary Air-Conditioners.

ARI Standard 240-57, in addition to establishing rating conditions and requirements, specifies requirements for safety, for drainage and defrosting provisions, and for the following performance tests:

1. Maximum Operating Conditions Tests (Cooling cycle and heating cycle).
2. Low Temperature Operating Tests for Cooling.
3. Insulation Efficiency Tests (Cooling cycle and heating cycle).
4. Automatic Defrost Test. This Standard also specifies minimum available external static pressure, based on the Standard Rating cooling capacity.

At the same meeting where it was decided to include heat pumps in the Unitary Air-Conditioner Certification Program, the Unitary Section of ARI also directed that ARI Standard 240-57 be revised to reference UL Bulletin 559, Standard for Heat Pumps, issued in August, 1959.

# Status of and Needs for Heat Pump Standards Outlined by Wm. L. McGrath

*By William L. McGrath,*
*Chief Engineer, Carrier Corp.*

With the growth of heat pump sales and the increase in the number of manufacturers engaged in the field, the need for standards in the design and rating of equipment is obvious. Failure to maintain and support reasonable standards could have unfortunate effect on the development of the industry. Reliability and adequate performance are factors even more critical where one depends on the equipment for heating than is normally the case when cooling only is provided.

## What Standards May Cover

Standards may cover: methods of testing for capacity rating, determination or certification of standard capacity ratings, ability to perform adequately under extreme and adverse conditions, safety with respect to wiring and electrical equipment, and safety with respect to working pressures or possible hazards.

At the present time, there are two industry equipment performance standards, one capacity testing standard, and two accepted safety standards which apply specifically to heat pumps.

Perhaps the most important of these is ARI Standard 240-57, Unitary Heat Pump Equipment, which applies to factory-made residential, commercial, and industrial heat pumps or matched assemblies. It does not apply to room air conditioner heat pumps or to cooling units that are field modified for heat pump operation. This standard calls for cooling and heating ratings to be expressed in multiples of 1,000 B.t.u.h., with any auxiliary heating to expressed separately. Rating tests are to be conducted in accordance with ASRE Standard 16-56 at the following conditions:

| | Cooling | Heating |
|---|---|---|
| Indoor Air Temp. | 80°F. db, 67°F. wb | 70°F. db |
| Outdoor Air Temp. | 95°F. db, 75°F. wb* | 45°F. db, 42.9°F. wb |
| Water Temp. | 75°F. in, 95°F. out | 60°F. in, 45°F. out |

*When condensate is rejected to air stream, wet bulb is maintained.

The standard also ties down such factors as minimum air quantities, external resistance allowances, and lengths of interconnecting piping, which are important in obtaining accurate ratings on comparable bases. A most important provision is that of defining allowable production tolerances so that all production units must have cooling and heating capacities not less than 95% and power inputs not more than 105% of their published values.

The standard also recognizes: maximum operating condition tests to assure that the units will function under extreme weather and voltage conditions; a low temperature cooling operation test to assure that all units do not become inoperative because of evaporator frosting nor overflow while any such frost is melting; insulation effi-

*(Concluded on next page)*


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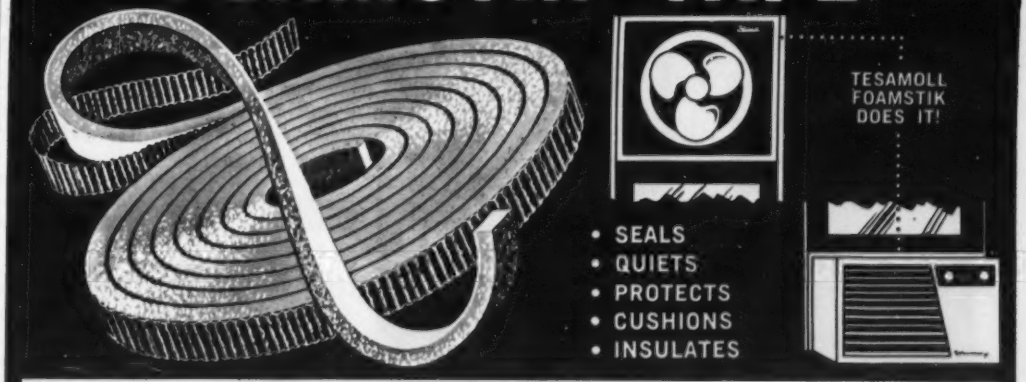


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# McGrath on Heat Pump Standards

*(Concluded from preceding page)*
ciency tests which are designed to prevent condensed moisture from dripping off the units; and an automatic defrost test which provides that defrost time not exceed 20% of the total operating time and that indoor temperatures do not drop below 70° F. for more than one minute during any defrost cycle.

Unfortunately, heat pumps are not presently covered under the ARI Certification Program for unitary air conditioners (certified capacity ratings and performance ability), although it is likely that they will be included as the program grows and expands.

### NEMA Standard Covers Room Unit Heat Pumps

Heat pumps room air conditioners are covered to some extent by NEMA Standard CN1-1958, room air conditioners. This standard covers operation on the cooling cycle quite adequately, but heat pump operation is included only to the extent that testing under ASRE 16-56 is specified and that heating capacities are to be included on the unit nameplates. This standard permits an 8% rating tolerance.

As noted before, the ARI and NEMA standards call for testing under the ASRE (now ASHRAE) Standard 16-56, which requires room calorimeters for testing room air conditioner heat pumps, and psychrometric calorimeters along with refrigerant flow measuring apparatus for other heat pump testing. This standard was initially prepared in 1949 and has become inadequate, or at the least vague and somewhat confusing, with respect to much present-day equipment, including heat pumps. The society has recognized this situation and is currently working on several new standards to replace 16-56. One of these will be devoted exclusively to heat pump testing and will become ASHRAE Standard 39. Publication is probably a year away.

### UL Standards

The Underwriters' Laboratories have published two standards covering heat pumps.

The first is the Room Air Conditioner Standard U.L. 484 last issued in September, 1957. This covers both straight cooling and reverse cycle or heat pump Room Air Conditioners rated at less than 250 volts and 20 amperes.

The second is the Heat Pump Standard U.L. 599 which was first issued in August, 1959. This covers packaged, central systems. The scope would cover testing of machines up to 30 hp. and 600 volts and thus includes all of the factory assembled residential units and most of the commercial units present on the market.

The Heat Pump Standard is the one of primary interest. Its publication has been long overdue, since for a number of years heat pumps have been examined under the rules of other standards or rules have been improvised with resulting uncertainty about requirements.

The U.L. Requirements for Heat Pumps are similar to those for Central Air Conditioners and cover the design, manufacture, and testing of the units. They are aimed primarily at securing safe equipment from the standpoint of fire or physical hazard to the occupants or the buildings in which the units are installed. Ratings, efficiency, or other operating characteristics are of no concern. Thus the requirements deal primarily with wiring materials and methods, electrical spacings, casing thicknesses and corrosion protection, and the ability of the refrigeration circuit to withstand the pressures, or temperatures generated under both normal and abnormal operating conditions. The type and operation of both the electrical and refrigerant protective controls is also examined.

To determine the compliance of a specific design with the requirements, a typical unit plus sample component parts must usually be submitted to U.L. for examination and test. A total of 11 operating tests can be required, including operation with supplementary electrical heaters. Since the U.L. does not presently have sufficient facilities, the majority of the tests are conducted in the laboratories of the manufacturer. In addition to the requirements in the Standard for Central Cooling Units (UL 465), Standard 559 requires some seven additional operating tests on a heat pump.

Provided that these tests are passed and a U.L. listing is obtained, some testing is required in the factory as units are produced. Primarily, this consists of examination of production methods and pressure test on the refrigerant circuit.

In addition to these standards which are written directly for heat pumps, the following standards are of general application to equipment of this type:

American Standards Association Standard B9.1 (Safety code for mechanical refrigeration).

National Electric Code (NBFU).

American Society of Mechanical Engineers "Unfired Pressure Vessel Code."

National Board of Fire Underwriters Bulletin #90.

In the case of larger sizes of heat pump equipment, design and examination follow these codes, and standards in some respects result in more conservative design than would be admitted under the Underwriters Laboratories standard.

Finally, it has become the practice for electric utilities who promote the sale of heat pumps to develop their own formal or informal standards of equipment adequacy and service or installation requirements.

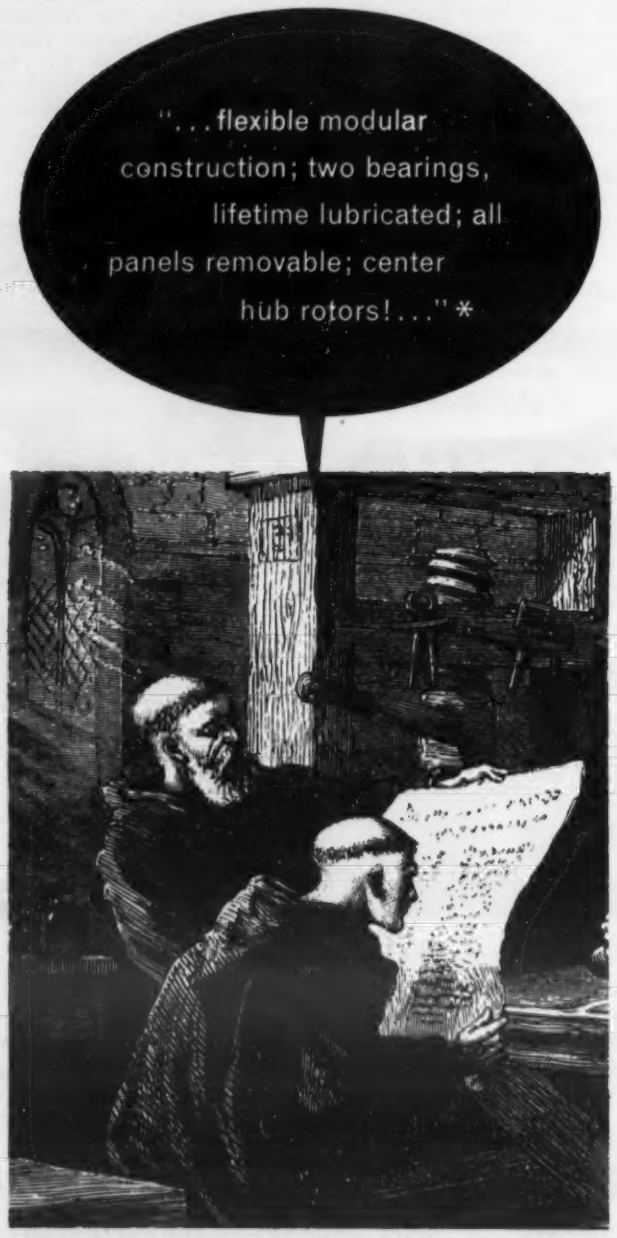
These measures, added to those taken by the industry, go a long way toward assuring satisfaction to the ultimate user and sound growth for the industry.

## Amana Will Sponsor Garry Moore on Radio

AMANA, Iowa—Amana Refrigeration, Inc. has returned to radio sponsorship for the first time in four years and the program brings back to the airwaves another longtime absentee from radio, Garry Moore.

The five-day-a-week midmorning show is heard over 191 CBS station, starting at 10:30, New York time. Moore, with Durward Kirby, his professional sidekick for many years, runs an informal 10 minutes of general chatter, theatrical reminiscences, and audience interviews.


"...flexible modular construction; two bearings, lifetime lubricated; all panels removable; center hub rotors!..." *



* "...and packed with many more facts in a just-printed, 48-page catalogue about what D-H *now* offers you in its popular 30-model central station air conditioning units (horizontal and vertical). Handy time-saver fan performance curves included, too!" Contact direct for Engineering Manual No. CSHV 312, and name of Manufacturer's Agent nearest you. *Send for yours.*

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## NCRSA Leaflet Tells Benefits of Buying From Distributor

PHILADELPHIA — A leaflet entitled "Convictions of a Food Store Chain Operator" that brings out the advantages and services available to store owners who buy equipment through their local distributor is currently being offered by the National Commercial Refrigerator Sales Association.

The leaflet is based on a talk given by Bernard R. Stevens, president of Stevens Markets, Inc., Miami, at the NCRSA convention there last fall.

It tells how refrigeration distributors help free store management of many problems.

Copies may be secured from NCRSA headquarters, 1900 Arch St., Philadelphia 3.

*From Supermarket to Variety Store*

# Shopping Center Proves To Be Good Market for Ice Making Machines

ATLANTA — The expanding market for ice machine sales was spotlighted in a multiple installation at the Broadview Plaza Shopping Center here.

The center has installed 13 ice machines in locations ranging from supermarkets to a variety store. Automatic Ice Maker Co., "Scotsman" ice machine distributor in Atlanta, was a major factor in the multiple sale with 12 Scotsman machines placed in various Broadview Plaza units, it was pointed out.

"Considered as a group, these ice machines can deliver more than four tons of ice to Broadview stores," stated George Vance, president of Automatic Ice Maker. "Several of these Broadview stores have previously bought ice machines from us, and other sales were promised for future months. The Broadview Plaza installation is a real landmark in the young ice machine business."

Broadview Plaza stores installing Scotsman ice machines include the following:

Knight Hawk Grill (350-lb. capacity Flaker); Winn Dixie supermarket (550-lb. and 1,000-lb. capacity Flakers); Walgreen drugstore (1,000-lb. capacity Flaker); Kresge Co. variety store (1,000-lb. capacity Flaker); W. H. Belk department store (350-lb. capacity Flaker); The Big Apple supermarket (500-lb. capacity Flaker); Broadview Bowling (350-lb. capacity Flaker); G & M Cafeteria (2,000-lb. Super Flaker); Sweet Shop 350-lb. capacity Flaker incorporated with Bastian-Blessing equipment); and Key Club (2 - 225-lb. cubers Scotsman Cuber).

The G. C. Murphy Co. installed another make ice machine with crusher.

The Broadview Plaza ice machine installation is said to be one of the largest ever made to a shopping center group. It provides convenient ice supplies for virtually every store in the center that offers food and beverage service.

Termed the largest shopping center in the south, the Broadview Plaza opened in 1958. It provides over a million square feet of parking for patrons and its directory lists more than 52 tenants.

BROADWAY PLAZA'S Big Apple supermarket Manager Otis Jones examines his Scotsman continuous flow Super Flaker. Big Apple branches purchased five Scotsman ice machines last year and planned to buy additional Scotsman machines for 15 new units.

### Bulletin Describes Food Plant Floors

MERTZTOWN, Pa. — "Furnane" food plant floors are described in Bulletin 3-2, recently up-dated and offered by Atlas Mineral Products Co. here. The floors have been successfully installed in hundreds of dairies, packing houses, bottling plants, canneries, and other food processing plants across the country, the company said.

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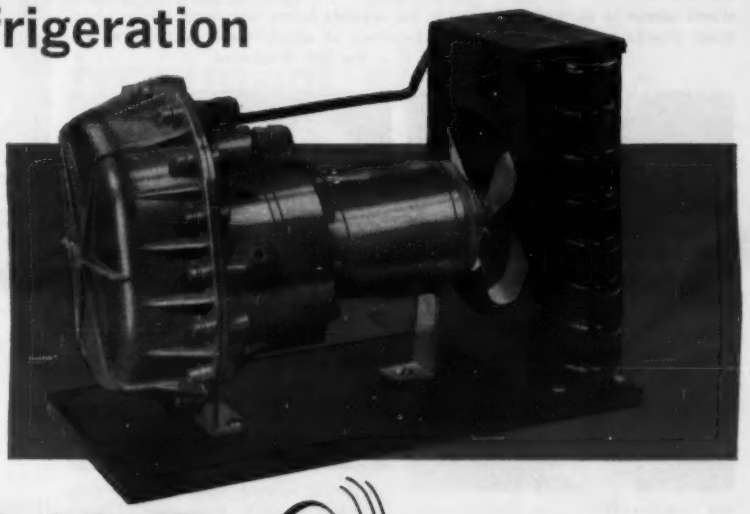

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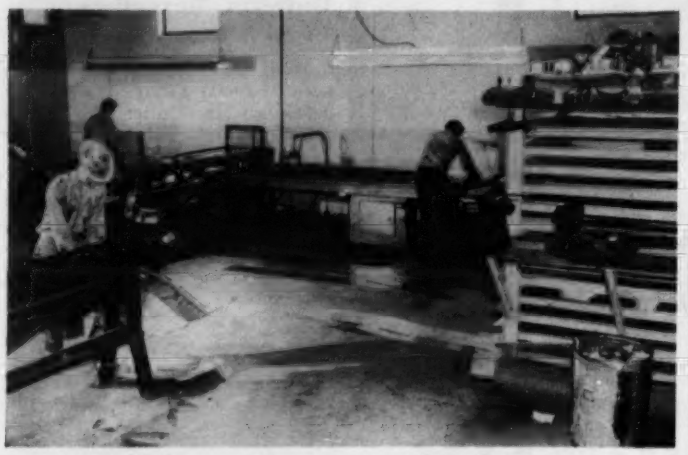
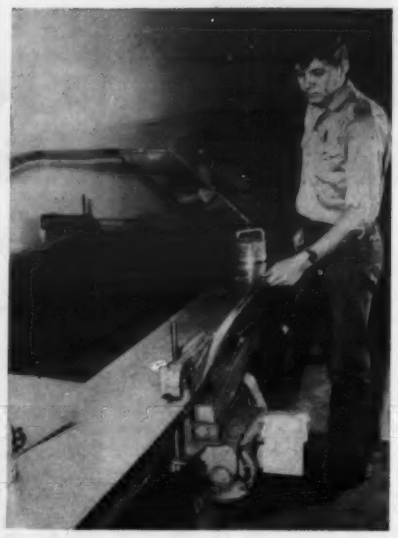
# Sheet Metal Shop Improves Profit Picture

***HAVING THEIR OWN SHEET METAL** shop is a project most air conditioning dealers undertake for two principal reasons—to improve their profit picture, and to control the quality of their installations. But if the shop is not run properly and efficently, these objectives won't be attained.*

*This is the third instalment in a "picture story" series showing how Frymire Engineering Co. of Dallas, which makes the claim of being the "largest installer of residential air conditioning," has applied modern business methods and practices in the sale, engineering, installation, and servicing of air conditioning systems. This instalment shows some of the things that the Texas dealer does to get top efficiency in his sheet metal shop operation.*



PARTIAL OVER-ALL VIEW of the Frymire sheet metal department, which is "compact but efficient." Flat sheets are received through a door to the right and stored in a rack (shown in the right foreground). The machine in the rear along the wall is an Engel shopmaster, and represents an investment of approximately $3,000. The customary manual brake is in the left foreground.



THE MACHINE is used primarily for cutting straight lengths of duct, but may also be used for such operations as slitting. It also finds application in turning out such production items as stackheads, roof jack bases, S-clips, and the like.

COMPANY OFFICIALS feel that the most advantageous function of the Shopmaster is the speed with which duct sizes can be changed. It takes approximately seven seconds to rearrange four notching dies, which cut the outside notches to be formed into a Pittsburgh lock, and the inside notches for a V-groove to be used for drive clips. "On a project such as the 700-unit 'Accent' home development," says a Frymire official, "we could cut out and fabricate 700 typical patterns, thereby cutting fabrication cost immeasurably."

SHEET METAL shop superintendent checks out finished material being assigned to a particular job. The superintendent, with forms attached to a clipboard, checks to make sure that the crew going out on a job is not shorted on any items which would necessitate a mid-morning or mid-afternoon return or call-back into the shop.

THE "SHOPMASTER" is all that the name implies, say the Frymire officials. In addition to shearing lengthwise and crosswise, it also V-notches in any multiples up to 10 ft. and with any spacing between notches.

THE WORK is held securely to the working table which is constructed of heavy plate by two counterbalanced magnets which can be moved to any portion of the table. When the magnet is placed in the proper position, it is energized by an on-off switch.

## Improve Profits—With Better Methods

It is generally agreed that a major industry problem is the failure of dealers and contractors to make an adequate profit. There are some who believe that increased sales are the one and only answer to this, but many dealers and manufacturers feel that an improvement in business methods and operating procedures might produce greater profits on whatever sales volume is attained.

Much has been written and talked about by experts on the subject, and schools and other general educational methods have been devised to help the dealer. The approach of the NEWS in trying to provide some assistance will be in line with its general publication practices—to report how dealers have used modern business and operating methods to improve their volume and profits. This article is one in a continuing series.

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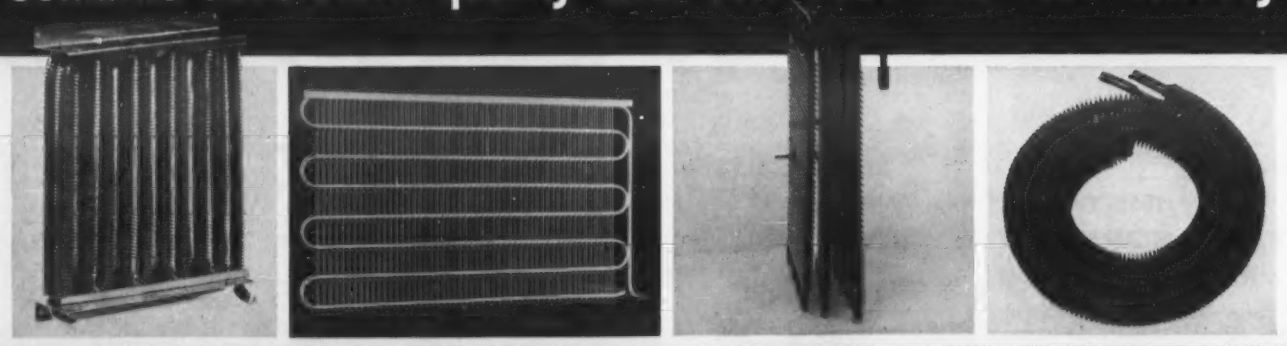

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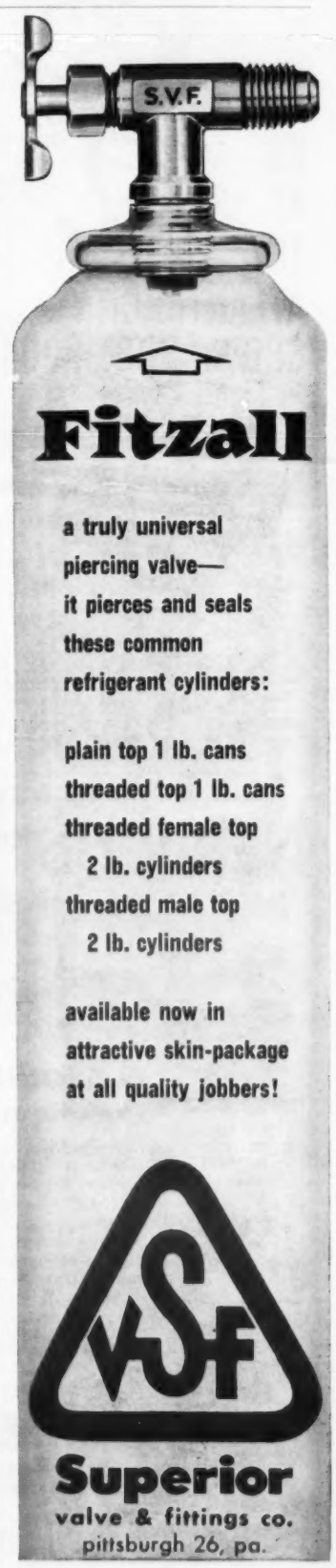
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# Refrigeration Problems And Their Solution

*(As Written by Paul Reed)*

## Why Coil Will Not Entirely Frost

**QUESTION:**

We have a 2-hp. Refrigerant-12 compressor operating a coil on a locker room job. The compressor is rated at about 15,000 B.t.u. at 10° F., and the coil about the same. We also have a 2-ton valve, dried, filter, heat exchanger, and sight-glass.

The run is only about 8 ft. from the compressor to the coil. The liquid line is ⅜ in. and the suction line is 1⅛.

The coil does not frost over except about two thirds of the way, although it does frost over sometimes. The expansion valve seems to be working o.k. Can you tell us why this coil will not frost over?

**ANSWER:**

The immediate cause of the coil not frosting over is that the expansion valve is not passing enough refrigerant to the coil to make it fully active. However, that does not mean that it is the fault of the expansion valve; the probabilities are that the valve is not at fault.

It is quite possible that the expansion valve is not set for a low enough superheat for your compressor-coil combination; that is, it may have to be opened somewhat to pass more refrigerant to the coil. Obviously, the coil is being partially starved, since part of it does not frost up.

On the other hand, you may not be able to get the coil to frost entirely over just by readjusting the expansion valve. Even with minimum superheat setting (wide open) it may not be able to pass enough refrigerant, although it is a 2-ton valve and is undoubtedly large enough for this job under normal conditions.

Again, this is not the fault of the valve. To pass its full amount of refrigerant, the expansion valve must be supplied with liquid only from the liquid line.

If it is supplied part liquid and part gas, it cannot pass its full capacity of refrigerant. The orifice in the valve is just so large, and the needle can only rise so far off the seat. It will pass a lot of refrigerant as a liquid, but if some of the orifice is taken up with gas, it will pass a great deal less refrigerant to the coil.

Presumably, your sight-glass is located in the liquid line just after the receiver but ahead of the filter, drier, and heat exchanger. That is where it should be for safety's sake. If you have enough charge, the sight-glass should show no bubbles.

### RESTRICTIONS IN THE LIQUID LINE AFFECT EXPANSION VALVE

However, if there is excessive restriction in the liquid line beyond the sight-glass, there will be enough pressure drop that some of the liquid refrigerant will vaporize going through these restrictions just the same as it does in going through the orifice of the expansion valve. Beyond the restrictions, there will be both liquid refrigerant and the vapor, so the expansion valve will not be getting straight liquid.

The greater the restriction, the more refrigerant will vaporize and the more space it will take up in the liquid line, and the less liquid refrigerant will get to the expansion valve. So maybe your expansion valve is being starved of liquid because of restriction or restrictions in the liquid line between the receiver and the expansion valve.

### LIQUID LINE TOO SMALL

In the first place, a ⅜-in. liquid line is too small for a 2-hp. unit even though the run is only 8 ft. It should be at least ½-in. tubing, which will pass twice as much liquid as the ⅜-in. line. For a 25 or 50-ft. liquid line, a ⅝-in. tube would have been right. A ⅝-in. line will pass over three times as much liquid as a ⅜-in. line. So your liquid line is too small, and is causing excessive pressure drop, and is at least part of your trouble, although perhaps not all of it.

There may be restrictions in the filter, drier, and possibly in the heat exchanger. The filter may be partly plugged with soldering paste, sludge from the compressor, copper fillings, iron dust, or just plain dirt. Of course, that is what a liquid line filter is for; to catch such material before it gets into the drier or expansion valve, or back to the compressor where it can do serious and expensive damage.

### CHECK THE FILTER

Feel the filter; if it feel much cooler than the liquid line ahead of it, it may be partially plugged. Better still, take the filter off and examine it. Blow through it with some Refrigerant-12 gas in the direction of flow. If it seems at all restricted, put on a new filter. To satisfy your curiosity, cut the filter open; you may be surprised at what you find.

With an efficient filter ahead of it, the drier should be clear and will probably not have to be changed, for your trouble does not sound much as if it were caused by moisture in the expansion valve.

These operations should enable you to get the coil fully active although, even with no restrictions in the liquid line, you may have to readjust the expansion valve somewhat. Also, when you get coil fully active you may find that you will have to add a little Refrigerant-12, if the charge was just barely enough before.

After clearing up the liquid line (and putting in a larger line), you check the location of the expansion valve bulb. If necessary, move it a little farther away from the coil. Since there is a heat exchanger used, this should not and probably will not be necessary. With such a short suction line, it was good practice to use a heat exchanger.

As mentioned above, your trouble does not sound as if it is due to moisture in the expansion valve, but the possibility should not be overlooked that there is just enough moisture to cause the expansion valve to stick a little.

Also, since this is a low temperature job, you should not overlook the possibility of wax in the expansion valve, although from your description, it does not show such symptoms. On a locker room or other low temperature system, you should always pay particular attention to the compressor oil, which should be the wax-free type.

If you change to a larger liquid line and clear up the possibility of restrictions in the liquid line, you will probably solve your problem.

## Chase Issues Copper Tube Fitting Catalog

WATERBURY, Conn.—A new copper tube fitting catalog, containing information on the making of solder joints and flared connections, is now available from Chase Brass & Copper Co.

Also included are data on types of solders and working pressures, dimensions of copper water tube, and flow capacities and friction loss allowances for both tube and fittings.

Copies of the catalog are available from any of the 28 local Chase warehouses or sales offices, or directly from Chase Brass & Copper Co., Waterbury 20, Conn.


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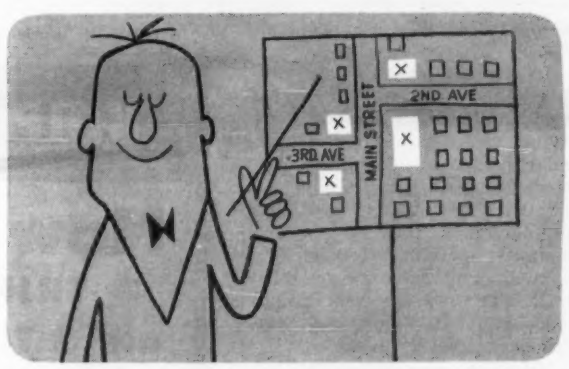


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# Gelatin Capsulating Machines Require Constant Temperature, Humidity Control

*By George M. Hanning*

DETROIT—The process of forming gelatin capsules and filling them with medicine or food materials calls for a high degree of control over surrounding air.

Not only must air temperature be held almost constant, but humidity must be maintained at a very low level and even static pressure must be held within ¼-in. w.g. All dirt and foreign particles must be filtered out.

Requirements such as these have resulted in a very interesting application of air conditioning in the plant of the R. P. Scherer Corp. here. Scherer manufactures soft, elastic gelatin capsules for vitamins, medicinal, veterinary, and special purposes, such as bubble baths and chicken fat capsules.

In the capsulating progress, warm liquid gelatin is spread over a slowly revolving stainless steel drum about 24 in. in diameter. Over the drum 400 c.f.m. of 57 to 59° F. air at 20% r.h. is blown.

The chill, dry air congeals the gelatin so that a tacky, elastic band rolls off the drum. This thin band is then automatically formed into capsules, filled with medicine, sealed, and dropped into a tray.

If the air blowing against the drum has too low a temperature, gelatin will set too rapidly. Then it becomes brittle and the ribbon breaks, stalling the manufacturing process.

Too high an air velocity will disturb the constant thickness of the gelatin ribbon being formed. If air temperature and humidity are too high, or air velocity too low, the gelatin will not solidify into a ribbon, with equally disastrous results.

Thus the need for constant temperature and humidity control.

From the capsulating machines, the soft, moist capsules are transferred to squirrel cage drying drums for rapid drying and then to drying tunnels for hardening before packaging.

Scherer now has 48 capsulating machines, plus dryers and drying tunnels in a 180 by 240-ft. room. The machines are lined up in four rows. There is enough space for 16 additional machines in present lines.

Actually, two separate, but interrelated air cooling systems are used to create the air conditions demanded by the capsulating machines.

One is an air cooling and drying system using Kathabar humidity conditioning units. The other is a chilled water cooling system that not only provides cooling for the machines, but air conditions offices and laboratories as well.

Housed just behind the capsulating room at the rear of the one-story plant, is the machinery for the Kathabar systems. In one room are two Westinghouse 50-hp. compressors and three Kathabar humidity conditioning systems that serve two rows containing 32 machines. In another room close by are two 50-hp. Trane compressors and one Kathabar unit that serves two rows containing 16 machines.

Between these rooms is an outdoor area containing two Acme evaporative condensers and an Acme cooling tower. The cooling tower is used on the make-up air unit and the evaporative condensers on the recirculated air units.

Two of the three Kathabar units in the first room chill, filter, and dehumidify 35,000 c.f.m. of recirculated air. The other conditions 12,500 c.f.m. of fresh air.

BELOW: All three steps of capsule making process are shown here. In foreground is capsulating machine. Behind it is drying machine. In rear is drying tunnel. Conditioned air comes out of underground duct beneath lower left portion of capsulating machine and blows against drum in center. Overhead are gelatin and product feeding drums. End of return air duct can be seen in upper right corner.

MAGNITUDE of capsulating operation at R. P. Scherer is indicated in this photo. There are 48 machines in the plant at present.

A separate humidity control unit is used for outside air because a single pass through the unit is not sufficient to reduce humidity level to the necessary 20 to 22%, especially on humid days.

After passing through this unit, the air is then mixed with recirculated air and passed through another humidity control unit for final conditioning to 60° F. and 20% relative humidity.

A blower then drives the conditioned air to an underground pit where four chilled water coils hooked up in series are located. Passing through these coils reduced air temperature to 57° F.

Chilled water coils are used for final temperature control because the humidity control system itself cannot hold, under varying ambient conditions, the precise temperature required.

Flow of 42° F. water through the coils is modulated in response to a thermal bulb downstream from the coils. Indicating instrument is in the capsulating room.

Similarly, the humidity control unit in the second room conditions 17,500 c.f.m. of recirculated air only. This air, too, is driven to an underground pit where it passes over four chilled water coils for final tempering.

The four coils were installed in anticipation that a second humidity control unit will be


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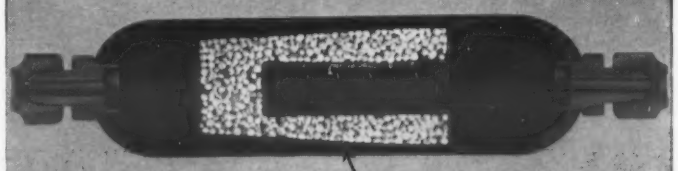

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needed later. The pit is rather difficult to get to, and it was felt it would be better to do the entire job at one time. Using four coils instead of one large coil also acts as a safety factor. If one of the coils develops a leak, the others can carry the load, allowing production to continue.

From each pit, the tempered air is fed through a 5-ft. diameter plenum to two 4-ft. round galvanized branch ducts.

The branch ducts run in parallel straight lines the length of the capsulating room directly beneath the rows of capsulating machines. About 700 c.f.m. of air feeds from the duct up through an opening beneath each machine.

Two hundred c.f.m. blows onto each side of the revolving drum and the rest escapes through adjustable louvers in the machine cabinet into the room. Air flowing over the drum also dissipates around the edges of the drum into the room.

Two of the branch ducts handle rows of 16 machines each. The other two supply eight machines each. Excess air in the latter ducts feeds into a riser at the end of the room and then into an overhead duct where it is distributed through grilles into the room.

It not only provides comfort cooling for employes, but maintains a slight positive pressure on the room, protecting it from infiltration of more humid, unfiltered air.

### Air Dries Capsules

After serving the capsulating machines, there is still more work for conditioned air to do.

The drying machines, only a few feet away from the capsulating line, pick up 700 c.f.m. of 72° F. room air. In each machine, a series of six blowers on a single shaft force air up over drying lamps and then through revolving wire squirrel cage dryers filled with bouncing capsules.

A seventh blower on the same shaft then drives the air, now about 80° F., through a short underfloor duct to the drying tunnel. There air is again filtered to be sure no dust gets on the capsules. With an additional 300 c.f.m. picked up from the room 1,000 c.f.m. of air is circulated by an overhead blower over trays of capsules.

After each pass over the trays, 1,000 c.f.m. of this air is bled into the overhead return air duct. This air, along with room air drawn through grilles in the duct, is returned at about 82° F. and 30% r.h. to the Kathabar systems. There it is dehumidified, mixed with fresh air, and chilled to 60° F. again.

Thus, in a single cycle, the air serves three manufacturing processes and provides comfortable working conditions.

A portion of the air is also supplied to the adjacent 60 by 120-ft. medical preparation room. It is here that ingredients for capsules are stored and mixed.

This room uses all recirculated air and is equipped with its own Kathabar unit to reduce relative humidity to 22%.

Adam Dargas, maintenance supervisor for Scherer, emphasized that constant, unvarying performance during manufacturing operations is an essential feature of the air conditioning system.

### How Humidity Level Held

He explained that moisture content of the air leaving the Kathabar unit is regulated by the temperature of the Kathene solution. At a constant density, the solution will remove water in an amount inversely proportional to its temperature.

So, in order to produce air at a given degree of dryness, the density of the solution is held constant by maintaining a constant volume and regulating the temperature of the Kathene solution.

Dargas uses condensate from steam return lines to maintain a constant liquid level in the Kathene tank.

When liquid level drops, he explained, air pressure on the liquid level control in the tank also drops. When air pressure falls to 5 lbs. or lower, a Powers modulating valve opens, allowing condensate to run into the solution.

TRANE 50-hp. compressors and chillers and Kathabar unit are housed in equipment room at rear of plant. Evaporative condensers and cooling tower are outside directly beyond this room.

Likewise, as liquid level rises, air pressure on the liquid level control increases. When it reaches 8 lbs., the steam line into the regenerator is opened, drawing off excess water. Thus, liquid level is held within very narrow limits.

To maintain uniform head pressures in the refrigeration equipment that chills the Kathene solution, Dargas employs a Powers 252 pressure regulator. This operates a modulating valve on the condenser water line to provide a 140-lb. head.

"We feel that 140 lbs. head gives us most economical operation of the equipment and avoids start-up difficulties due to low head pressure," Dargas said.

Dargas has avoided the winter freeze-up problem on the outdoor cooling tower and evaporative condensers by injecting steam into their supply tanks whenever water temperature drops below 60° F. Fans on the cooling tower and evaporative condenser stop operating when water temperature drops below 70° F.

The same head pressure control setup is provided for the chilled water system.

### Chilled Water System

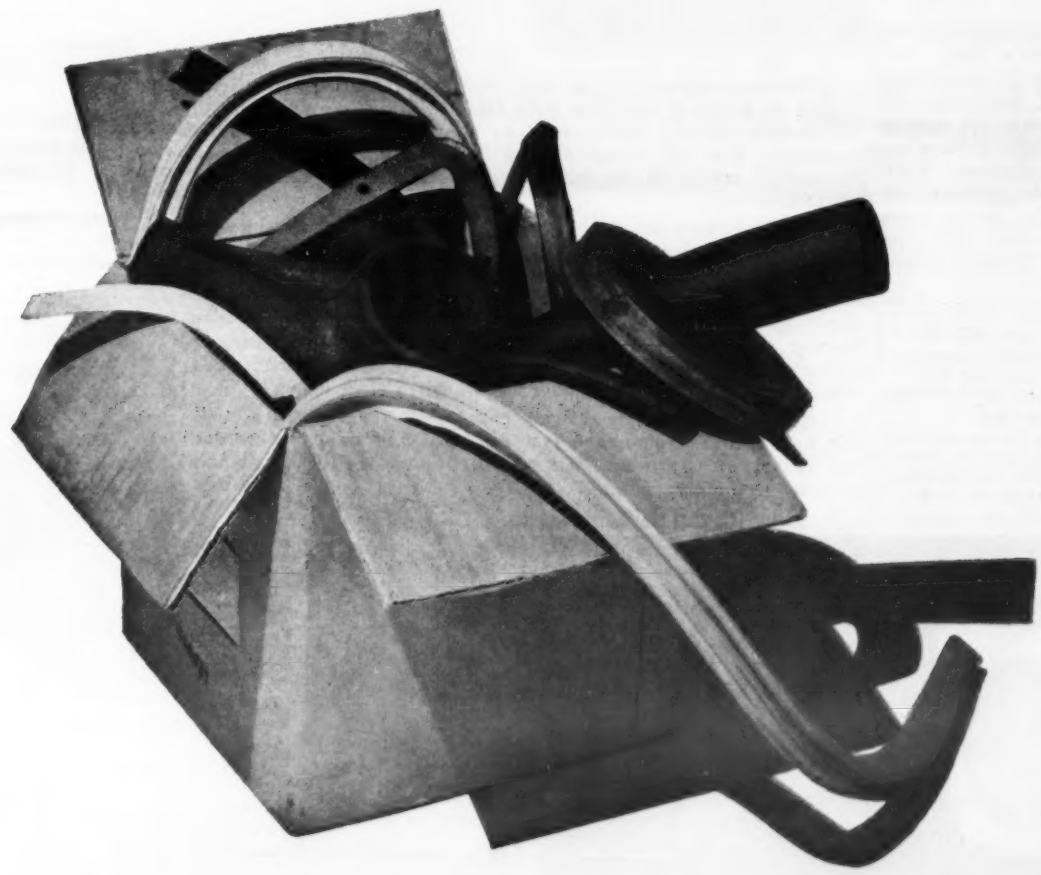
Cooling equipment for this system is installed at the front of the plant. Four Westinghouse chillers cool and circulate some 2,000 gals. of 42° F. water through the plant.

To prevent the water pump from being starved a 600-gal. storage tank acts as a reservoir. Water is pumped from the tank through the chillers and into chilled water lines.

A Powers temperature control beyond the last machine

*(Concluded on next page)*

B.F.Goodrich



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## Gelatin Capsulating-

*(Concluded from preceding page)*

operates Mercoid switches to kick compressors on and off as chilled water temperature fluctuates. Variation is kept within 2° F. of 42° F.

During summer, two additional 50-hp. Westinghouse compressors operate constantly to handle the increased heat load. The 40-hp. chillers are started up as needed to hold the 42° F. water temperature.

Because of the size of this system, condenser water is cooled in a 250,000-gal. spray pond that decorates the front of the company's property, rather than by a cooling tower.

Along with temperature and humidity control, filtration is also an important aspect of air treatment at Scherer. Dust and foreign particles cannot be permitted to get into or on the moist capsules.

Make-up air is passed through an oil bath filter before passing through the Kathabar units, where the Kathene solution further washes it.

Recirculated air passes through Pittsburgh Plate Glass throwaway filters on leaving the Kathabar units. Then, before the air goes into the drying tunnels it is filtered a third time.

Floor in the capsulating room is tiled to eliminate dust.

Thus with the Kathabar system to control humidity, the chilled water system to control temperature, and three-stage filtration to control dust, Scherer is able to maintain accurately controlled clean room conditions suitable for the manufacture of pharmaceutical products.

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# TECH CENTER

*by Frank J. Versagi, Technical Editor*

***Beginning A New Series on Electrical Fundamentals***

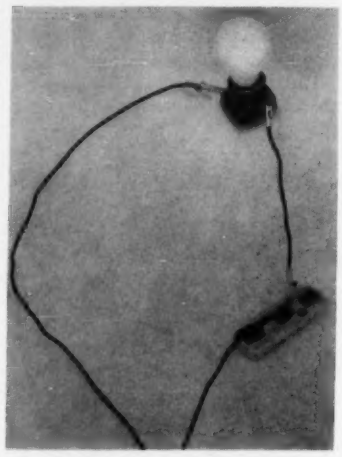
# Applied Electrical Theory

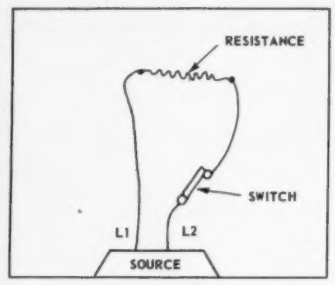
## (1) Basic Terminology

For the reader to be able to follow later discussions in this series, he must clearly understand certain fundamental terms and principles. At the beginning, we will define and explain these terms and principles so that all readers will be at the same level of understanding when more complex theory and applications are discussed.

* * *

This is a simple electrical circuit.






The term **circuit** is to be taken literally, for unless electricity is able to follow a complete path from and to its source, it will not accomplish any work—such as lighting a lamp or running a motor. The two wires at the bottom of the illustrations, marked L1 and L2 in the diagram, go to the source of electricity for this circuit.

The electricity flows from and to the source, passing through the switch and through the bulb on its way. We say that electricity **flows.** This popular conception of an electrical current **as a flow of electrons** reflects the common attempts to make electrical phenomenon understandable by direct comparison to flowing water. (Note the term **current** which slipped into our discussion.) For our purpose, it is sufficient to say that when electrons move through a material, we have electricity.

Electrons are the negatively charged particles in an atom—the ones which are always pictured revolving in orbits around the center of the atom, just as Earth and the other planets revolve around the sun.

For electricity to flow, there must be, at the source, a build-up of electrons sufficient to create a pressure or force. This electron build-up may be accomplished chemically, as in a battery; magnetically, as in a generator; by heat, as in a thermocouple. The proper term for this pressure is **electromotive force, emf.** Since the unit of measurement for emf is the **volt,** the term **voltage** is synonymous with electromotive force in practical work.

As is the case in all motion, the movement of electrons through a material is opposed by friction. Depending on the material, this opposition to electron flow, called **resistance,** may be great, moderate, or low.

Copper, for example, offers low resistance to the flow of electrons; therefore this metal is by far the most common electrical conductor used—whether in the form of small wires, large cables, or giant bus-bars. Aluminum is also a good conductor and is increasingly being used in electrical work. Tungsten, used in the filaments of incandescent lamps, offers a very high resistance to electron flow.

The unit of measurement for electrical resistance is the **ohm.** Devices, such as bulbs, with high resistance are called **resistors** and are denoted by a wavy line in wiring diagrams.

* * *

If the total resistance in a circuit is great enough to prevent entirely any flow of electrons at a particular emf, no current can pass. As soon as the voltage is enough to overcome the resistance, electrons flow through the conductor and the resistor. For practical purposes, we are interested in knowing how many electrons flow past any point in a circuit during a given time. It is this **rate of flow** of electrons which is properly called **current.**

The unit of measurement for rate of electron flow is the **ampere,** almost always called the **amp.**

Summarizing:

Electromotive force is expressed in volts.

Electrical resistance is expressed in ohms.

Current, electrical rate of flow, is expressed in amps.

* * *

Applying this information to the simple electrical circuit:

A voltmeter shows the electromotive force is 120 volts; an ammeter indicates the current is 0.6 amps. Obviously, the emf is sufficient to cause current through the total resistance offered by the wires and the bulb. This total resistance may be measured with an ohmmeter or it may be easily calculated as will be described later.

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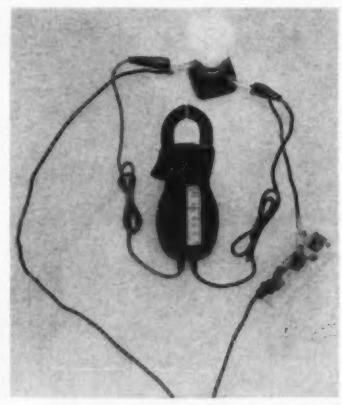

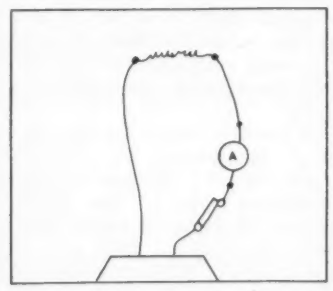


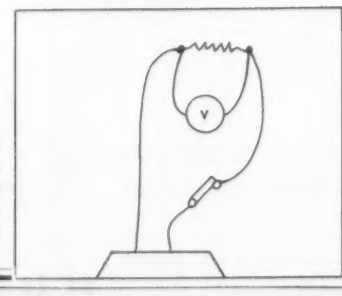


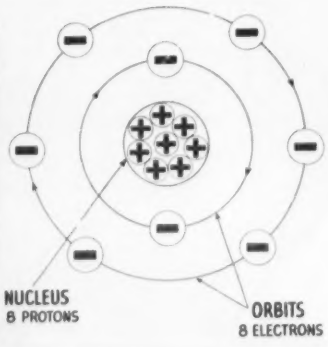


DIAGRAM at far right shows how ammeter is inserted in a circuit. To left of the diagram, the photograph and line drawing show proper placement of a voltmeter.

### For Electricians Only

**SAN DIEGO, Calif. — The six freezers for the new Hale Junior High cafeteria came with three-prong electrical plugs.**

**Two electricians arrived the next day. One changed the plugs to two prongs. The other changed the wall receptacles to three prongs.**

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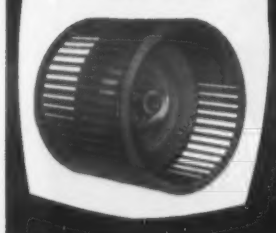

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Write for information to- WABASH CORP. / 2300 S. Western Ave., Chicago 8 EXPORT DEPT. 13 E. 40th St., New York 16, N.Y.

## To Help You Learn

**1. Quite rapidly read over the entire article for the week. This gives you the general significance of the article and shows the relationship among the several parts of the discussion.**

**2. Reading as slowly as necessary, study each group of paragraphs. Stop and in your own words "tell somebody" what you have just read.**

**3. Do not be frightened by drawings and diagrams. Remember even professional engineers do not read a drawing at a single glance. They read line by line, or area by area. Do the same thing and actively follow on the drawing any discussion related to it.**

**4. Completely on your own, draw any diagrams used in the article, explaining them as you go. When you can do this, you know the subject.**

*(Continued from preceding page, Col. 5)*

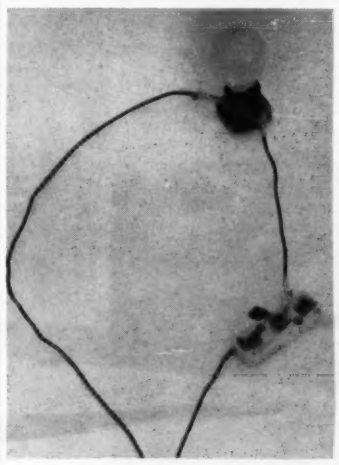
With the same current flowing through the wire conductors, the switch, and the bulb, why do they not all get hot enough to emit light? Recall that various substances offer different resistances to the flow of electrons. Stated another way, a copper wire and a tungsten wire of the same diameter and length can both pass 0.6 amps under a pressure of 120 volts. But the electrons must work harder to get through the high-resistance tungsten than through the low-resistance copper. The harder work in this case results in heat and light.

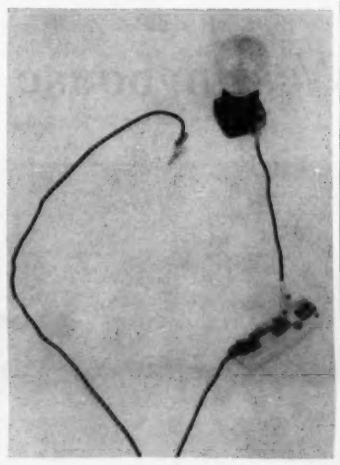
An ohmmeter will show the resistance of the wire conductors to be practically zero; the resistance of the 25-watt bulb is about 570 ohms, when lighted. Obviously, the current can more readily flow through the copper than through the tungsten filament of the lamp.

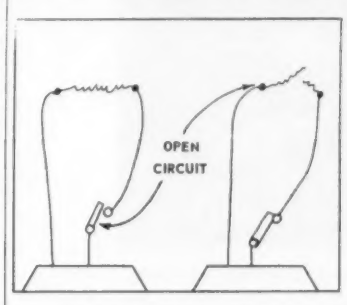
If the resistor were not in the circuit, and only copper wire was connected to the emf, too much current—too many amps—would flow, and the copper wire would overheat and burn out (or a fuse would blow as will be explained in another article). We would have, in effect, a **short circuit.**

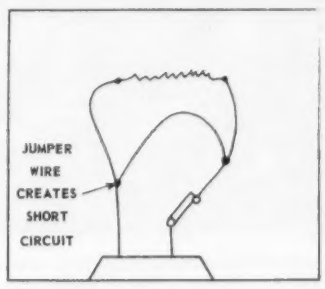
A **short** occurs when the current takes an accidental path which does not pass through the circuit's normal devices, causing the total resistance to drop near zero. If L1 and L2 were bare and accidentally touched, for example, or if a copper jumper wire were installed ahead of the resistor, the current would take the path of least resistance and never reach the bulb. Since the resistance of the copper wire alone is low, so many amps will flow that even the highly conductive copper would overheat.

An **open** circuit occurs when, for any reason, the path for current flow is broken. Pulling the switch opens the circuit. A broken wire or broken bulb filament has the same effect.








While some substances are non-conductors in a practical sense, any material may be made to pass some current if a sufficient emf is applied. Thus, with the switch open, if a higher and higher voltage were supplied through L1 and L2, at some point a spark would jump across the open switch contact, indicating current has passed through the gap. Though air is normally a non-conductor, it will pass current if the voltage is high enough. (Artificial lightning can be made to travel hundreds of feet through the air.)

A circuit is said to be **closed** when all necessary contacts are joined to permit normal current flow through conductors and resistors. The term must not be misunderstood to mean that the circuit is closed to current flow, as a valve might close off or shut off water flow. The circuit in the first set of illustrations above is closed; current flows through properly made contacts and properly connected wires and resistor.

Next: OHM'S LAW.

## Waco School Trustees Decide on Cooling Entire School, Because The Cost Is So Low

WACO, Texas—Contracts for Waco's first completely air conditioned school were awarded recently to Jones & Williams Construction Co., general contractor; Tex-Mech, Inc., mechanical contractor; and Jordan Electric.

The three local firms submitted low base bids totaling $373,600, or $10.80 per square foot, including air conditioning, for the new Parkdale Elementary, it was reported.

Trustees decided to air condition the whole school after bids on cooling equipment showed that all the school could be cooled for only 33 cents per square foot more than by just air conditioning the administrative section, as was planned.

The $10.80 per square foot cost is below average in Waco for school construction, it was stated. The trustees said the extra equipment is so reasonable they would include it.

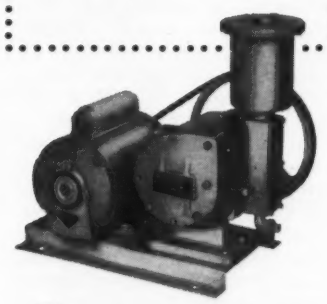
The last elementary school built here—Mountainview—cost $11.41 per square foot, with air conditioning in only about one-fifth of it.

Partial air conditioning has been common practice for years. However, the trustees said they had never before been shown in black and white just what extra cooling equipment would cost.

According to architect Larry Boyd of the firm of Wiedemann & Salmond, the Parkdale school was designed compactly, eliminating excessive exterior wall space, which he credited with the low square foot cost.


Now!
get the reliability
of complete
dehydration
with Stokes

**Compound High Vacuum Pumps**



Completely removing water vapors and other condensables before introducing refrigerants stops formation of corrosive acids that will cause operating trouble and damage to equipment. These new Stokes pumps were designed specifically to give you that extra protection. All this is accomplished at room temperatures; no heating, torching or bake-out. And look at their features! Rugged, reliable industrial construction, fast-pumping, lightweight, compact, portable, quiet . . . giving you *more performance per dollar than any comparable pump!* For full information, just print your name below and attach this ad to your letterhead.

(till in name)

*Vacuum Equipment Division*
F. J. STOKES CORP.
5565 Tabor Road
Phila. 20, Pa.

**STOKES**



**SALES ENGINEER**

**Peripheral Air Conditioning Equipment**

**Major manufacturer seeks a sales engineer to promote and sell fan-coil and through-the-wall integrated heating and air-conditioning unit systems to consulting engineers and mechanical contractors in New York City. Degree desired and a minimum of five years selling experience on this equipment in the New York market. Position is a permanent addition with salary and incentive bonus—all expenses paid—local travel.**

**Our employees know of this advertisement.**
Interested candidates please submit in confidence a detailed resume indicating salary requirements
**BOX A6376, Air Conditioning, Heating & Refrigeration News**

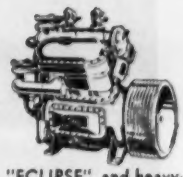


**Yes!**

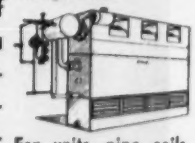
***We have all the components***

**FRICK DISTRIBUTORS *and* FRICK USERS can select from the industry's greatest line of compressors, condensers, coolers, coils and controls.**

They also get the advantages of many exclusive Frick engineering developments, a few of which are illustrated. When you or your clients need air conditioning, refrigeration, ice making or quick freezing equipment, in any commercial or industrial sizes, check first with Frick.



"ECLIPSE" and heavy-duty compressors: sizes up to 1,000 tons refrigeration.



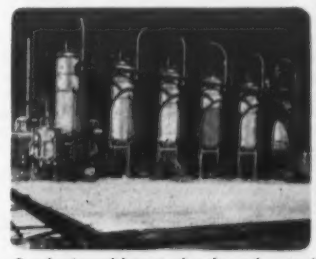
Fan units, pipe coils, shell, zig-zag and other types of coolers for air, water, brine, etc.

**FRICK CO.**
REFRIGERATION SINCE 1882
WAYNESBORO, PENNA., U. S. A.

Valves, Fittings and Controls, for manual or full-automatic operation.

Prestfin coils have 9 to 13 times the surface of bare pipe, assure high humidity in storage. Also remove superheat from hot gases.

Evaporative and shell-type condensers.



Synthetic rubber and other chemical plants find Frick patented systems the answer to various needs.

Shell-Ice is frozen automatically on stainless-steel tubes, is hard and clear. Preferred in fountains, restaurants, dairies, poultry plants, fisheries, by shippers, etc.

## Frigidaire Line--

*(Concluded from Page 1, Col. 4)*

rectly at them, providing the new "stereo-cooling" effect.

Cool, dry air can be distributed in any direction—up, down, right, left, or any point between—all in one direction or half one way and half another.

Lehman described as "revolutionary" the design of the new Pin-Fin cooling coil which is an important part of stereo-cooling in Frigidaire's top models.

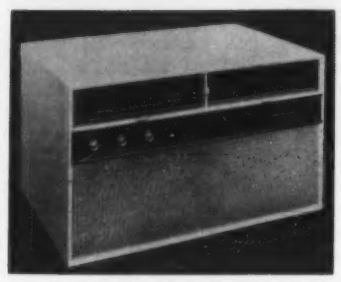
The Pin-Fin cooling coil, it was claimed, speeds up both cooling and moisture removal. The new coil has "thousands of aluminum pins" brazed internally, and also externally, through which air flows, it was pointed out.

In addition to increased efficiency, this coil makes possible a quieter operating unit in a smaller, more compact cabinet, according to the announcement. The Imperial room units feature new low silhouette cabinets 16 in. high, 18¼ in. deep, and 27 in. wide.

There is a new foamed polystyrene air guide located behind the air discharge grille "which not only spreads the air more evenly across the surface, but soaks up operating noise and insulates the cabinet top." This feature in combination with the Pin-Fin cooling coil and two quiet centrifugal fans provides an exceptionally low sound level, Frigidaire engineers say.

"Another stand-out feature is a unique 'Hi-Dri' control on some of the new models," it was stated. "This setting permits continuous cooling and dehumidifying, especially useful when humidity is high and the temperature mild.

"Also new this year are efficient aluminum filters on Imperial models which screen out



* * *

dust, pollen, and lint. This filter is easily removed by tilting down the air intake grille at the front. It can be washed clean in a jiffy and used year after year.

"Some of Frigidaire's new 1960 room units can be installed by do-it-yourself type buyers. There are no metal parts to cut to size."

A new metal wall sleeve 17½ in. high can be located at any height, even at floor level, permitting a snug through-the-wall installation in modern homes and buildings, the company said. The sleeve, together with inside and outside protective panels, can be installed during home or apartment building construction, then the Frigidaire room unit can be added later as required.

Frigidaire's 1960 room units are available with cooling capacities ranging from 6,000 to 16,500 B.t.u.h. Included are five Imperial, four "Custom Deluxe," and three "Deluxe" models.

"There are two 'All-Seasons' room air conditioners," it was noted. "One, a high-capacity Imperial model, will deliver 10,000 B.t.u. of cooling and 8,300 B.t.u. of heat on reverse cycle, and 8,500 B.t.u. by separate electric heater. This unit also features automatic changeover from cooling to heating and vice versa.

"In addition, there is a new Custom Deluxe 'All-Seasons' model with 8,000 B.t.u. cooling capacity and 7,200 B.t.u. of reverse cycle heating with automatic defrosting.

"Top performer of Custom Deluxe models is the new 'Lone Star' model which is designed with extra cooling and dehumidifying capacity. This unit will provide 12,100 B.t.u. of cooling, removing up to 5.2 pints of moisture from the air each hour. The 'Hi-Dri' setting is also featured."

Four 115-volt models are included in the 1960 line. All units are powered by the company's "Super Meter-Miser compressor." Top Imperial models come in harmonizing "Silver-Sand" beige with a walnut wood-grain finish on the control panel.

## Tax Date Decided--

*(Concluded from Page 1, Col. 2)*

covered only those air conditioners rated at less than 1 hp., on the basis of a ruling developed from the avowed intent of the tax to cover units designed only for household use.

However, the Internal Revenue Service had long been dissatisfied with this interpretation, and after having been involved in some lawsuits, issued a proposed new regulation in August of this year which imposes the tax on all "self-contained air conditioning units" which are "designed for use as a portable unit, console unit, or for installation in or in front of a window or other opening."

The industry has expressed some concern over the possibility that efforts might be made to tax small-capacity self-contained units designed for central residential systems or light commercial applications, and formal requests were made for better clarification of the definition of the taxable item. It is believed that some changes were made in the wording, although not all that the industry had requested. All water-cooled equipment is exempt.

The tax is imposed on manufacturers sales to wholesalers. Any sales of this type made before Dec. 1 will be tax-exempt, providing that proof can be shown that title to the goods passed from the manufacturer.

Some changes are also made in the new regulation in the imposition of the 5% tax on household refrigerator and food freezers, primarily in the deletion of arbitrary size limits of such products subject to the tax.

## ARW Change--

*(Concluded from Page 1, Col. 4)*

frigeration supplies and equipment wholesalers.

"We feel that the constant changes in our industry's marketing demands a closer relationship between the manufacturing supplier and the wholesaler," Koopman stated.

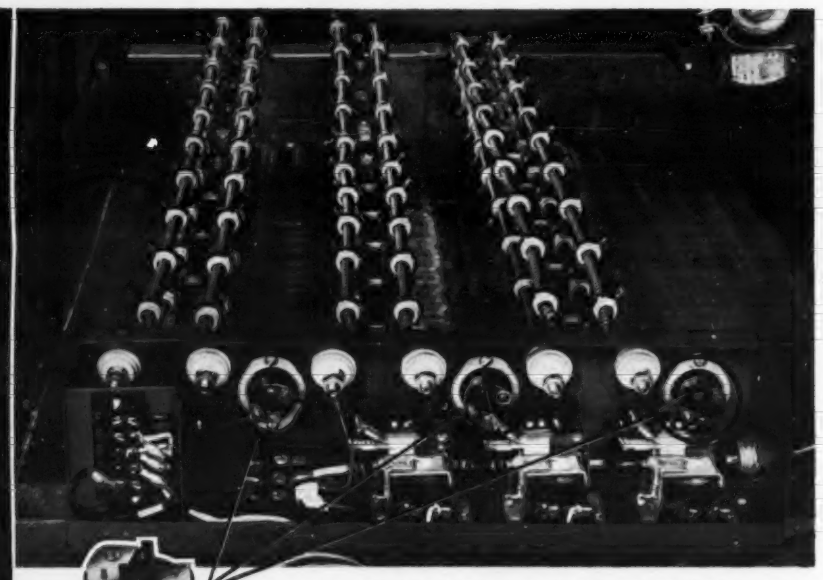
"We want the manufacturers to understand our problems and we want to know theirs.

"Associate membership in our association will permit both of us to plan programs that will better serve the trade and their customers."

Complete details of the program will be announced at a later date. It was emphasized that associate memberships for manufacturer suppliers will be by invitation only.


YOU CAN BE SURE...IF IT'S Westinghouse

Cutaway of the indoor section of the Westinghouse Heat Pump.



View of the auxiliary heating elements showing three KLIXON 202 Thermostats used as temperature-limiting controls.

...And Westinghouse Counts On

KLIXON *Snap-Acting* THERMOSTATS

For Trouble-Free Performance in Their Remote Heat Pump

Cooling in hot weather, heating when it's cold — complete year-round comfort — and it is all done automatically with one modern Westinghouse Heat Pump.

To insure accurate, trouble-free operation of their heat pump, Westinghouse uses *five* KLIXON Snap-Acting Thermostats in each unit. Three are used as temperature-limiting controls on the auxiliary electric heating elements. Another is on the discharge line of the compressor to limit discharge temperature. A fifth KLIXON Thermostat controls a small heater element which regulates compressor oil temperatures to prevent the refrigerant from condensing during shutdown.

Here's what Mr. G. L. Biehn, Air Conditioning Division, says about KLIXON Thermostats:

*"Their performance and dependability are evidenced by the fact that this division has used them in various pieces of our equipment for many years."*

Westinghouse — another leading manufacturer who specifies and uses KLIXON Controls. Available in both sealed and open construction, these controls are made in a wide variety of types and sizes. Fixed temperature settings are custom calibrated at the factory to meet specific application requirements.

Send details on your control needs, and let us acquaint you with the application possibilities of the KLIXON line. Also, inquire about engineering assistance at no obligation. Write:

METALS & CONTROLS

2411 NORTH MAIN ST., VERSAILLES, KENTUCKY

A DIVISION OF TEXAS INSTRUMENTS INCORPORATED

SPENCER PRODUCTS: Commercial Controls Department

# Industry Readies Wares for '60--

*(Concluded from Page 1, Col. 5)*

individual manufacturers and suppliers of components puts the increase over last year at 40% or better, and this means the residential system sales total must hit close to the 200,000 mark.

**Commercial Package Air Conditioners....110,000 units**

Some will question this figure, the highest in years, because of the known decline in the sales of the conventional water-cooled package commercial units. However, the air-cooled package must be counted in this category, and with split-systems included, the figure of 110,000 units could be low.

**Room Air Conditioners .....1,650,000 units (retail)**

Record is supposedly 1,700,000 for year 1955, but that figure might be unreliable. How is figure of 1,650,000 units (for the "air conditioning year" ended Sept. 1) arrived at? Through the arithmetic of some pretty well accepted statistics, namely:

Inventory as of Sept. 1, 1958 —650,000 units. Production during 12 months ended Sept. 1, 1959 — 1,250,000 units. Total available for sale, 1,900,000 units. Inventory as of Sept. 1, 1959, 250,000 units, thus making sales 1,650,000 units.

Sales of heat pumps contributed heavily to both the residential and commercial package unit increases. ARI statistics indicate that heat pump sales are running 100% or better above 1958, with the possibility that the totals for the year may run as high as 40,000 units.

**Commercial Refrigerators .....170,000 pieces**

This estimate of 170,000 units refers to sales of display cases, reach-in, and walk-in refrigerators in both regular and low temperature applications. This figure represents an increase of 12 to 15% over 1958 figures, and is based on an authoritative figures that for the first three quarters of 1959, sales were running at least 12% ahead of the 1958 figure.

**Water Coolers.....150,000 units**

Good general business conditions brought a boom in sales of water coolers, currently running at a 30% or better increase over 1958, which would put the figure for the year at at least 150,000 units, one of the industry's best years.

**Automatic Icemakers .....40,000 units**

A figure that's difficult to check, because there is no central reporting agency for makers of such equipment. It's possible that general good business conditions may have pushed the figure past the 40,000 mark, although there is heavy saturation in some of the more obvious markets.

**Refrigerated Venders .....80,000 units**

Some comeback from last year's slump, which reportedly dropped 50% from the boom year of 1957, when the total number of refrigerated vending units sold totaled 120,000 units or better. Sales reportedly moved up this year, but did not approach the 1957 figures. Ratio of bottle to cup venders continues at something better than 2 to 1.

In other commercial refrigerated products, farm milk cooler sales continue at a good rate, as the bulk tank type popularity continues to grow, and the overall annual rate of sales seems to hang around the 35,000-40,000 unit level. The market for ice cream cabinets and beverage coolers continues to drop, most of the sales being for replacement purposes, as the market for new equipment is handled by different types of products. Sales of both of these items are believed to have fallen below the 50,000 unit level.

**Auto Air Conditioners....500,000 units**

This is a rough estimate, based on some advance reports for the year, but it would seem to be in line with the general report of a 25% rise over 1958 sales.

**Dehumidifiers .....300,000**

Best year yet for this product, with at least a slight increase sure to be registered over the 275,000 units reportedly sold in 1958.

# Carrier Units--

*(Concluded from Page 1, Col. 3)*

sign inside and out, are included among the new room units being previewed the week of Nov. 1 by more than 400 Unitary Equipment Div. distributor representatives during a national sales meeting at company headquarters here.

The seven different model lines range from portables to units offering capacities up to 18,000 B.t.u. and mobile home air conditioners, according to Russell Gray, Carrier vice president and general manager of the division.

An "install-it-yourself" "Sceptre" series, weighing 115 lbs. and measuring 14 in. deep, in cooling capacities from 7,000 to 9,600 B.t.u., is expected to be one of the most popular, Gray said. It can be fixed in the window by the homeowner using a simplified mounting bracket rugged enough to hold the weight of a man, he stated.

The "Imperial" series provides the biggest cooling output, with an 18,000 B.t.u. model for larger rooms in areas of high heat and humidity.

Heat pump units which shift from cooling to heating "at the turn of a switch" are represented by the "Regal" line. Carrier portables will also serve as heat pumps when turned around in the window.

In most models, according to John Voigt, room air conditioner sales manager, the sound level has been reduced along the depth of the cabinet.

CARRIER's Sceptre Room Unit

Styling of the new models by Raymond Loewy was described by Voigt as stressing added convenience for the homeowner along with attractive appearance.

A portion of the grille is held by magnets and can be easily lifted for filter replacement or inspection, it was noted. The top section deflects air upward in its normal position, but can be tilted forward for horizontal airflow.


Victor Dry Beverage Coolers

*with easy-glide stainless steel lids that allow full use of cooler during rush periods*

Model FB-50

Model FT-2230

Model B-2835

Cutaway view shows controlled forced air cooling system with self-defrosting coil, heavy duty blower with oilless motor that forces the air up over the cooling coil and back down through the bottles to insure the coldest bottles always on top.

***the most dependable line of beverage coolers in America Today!***

*top bottle cooling first assures better tasting beverages when sold from a...*

Victor

*Quick, convenient loading...*
*Fast, dry and clean cooling...*
*More profitable, more attractive,*
*More efficient serving*
*of bottled beverages*

Quality-Crafted Refrigeration products with expert application engineering and multi-plant flexibility offer dealers a line that is complete in every respect with "service plus" and prompt delivery.

*Introducing The New Self-Contained SECTIONAL WALK-IN COLD PANTRY*

**NOW**

*in 4 economy sizes... built for a LIFETIME of service*

Model RT-50

For the finest custom design engineering...our engineers collaborate with your architect, contractor or engineer to serve you in unusual, critical, special problem refrigeration requirements.

You provide basic details. We supply engineering and layout service with complete drawings and quotations at no cost or obligation.

Dealer Franchises Available...

Victor PRODUCTS CORPORATION

901 POPE AVENUE, HAGERSTOWN, MARYLAND

# Servicing Automobile Air Conditioners

*(Vol. 4 — 1959 Models)*

BY C. DALE MERICLE

## FORD (2)

*Ford Div.*
*Ford Motor Co.*
*Dearborn, Mich.*

### SelectAire Controls

Two groups of controls are provided in the 1959 Select-Aire unit. One group is provided in a panel on the dash in the opening used for the standard heater control. Second group is located between the air outlets just below the dash.

Dash control panel (Fig. 4) is identical in appearance to the standard heater control, but the levers control the air flow in a different manner. Two horizontal sliding levers and a blower control switch are provided in this dash panel.

Upper lever controls setting of vacuum-actuated water valve supplying hot water to heater core and positions a "blend-air" valve which directs air flow either through heater core or evaporator.

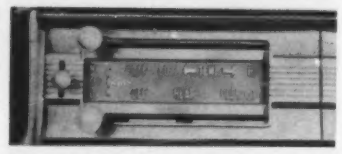


FIG. 4—Main control panel of 1959 SelectAire unit is on dash in opening used for standard heater controls.

Lower lever positions a "T-valve" to admit outside air to system for heating and/or directs air for defrosting.

Control knobs on either side of steering column, however, control admission of outside air to car.

When right-hand knob is pulled out (and left-hand knob pushed in) air conditioning system operates on recirculated air only.

Temperature control for cooling is determined by lever on air register assembly beneath dash (Fig. 1). When moved from the "off" position (extreme left) this lever controls setting of thermostat, which engages and cycles the magnetic clutch and compressor.

Levers to adjust air flow are provided beside the registers.

To obtain cooling then, (1) thermostat lever must be moved to right from "off" position, (2) blower switch must be turned to high or low speed position, (3) both heater levers must be in "off" position at extreme left, and (4) right air control knob should be pulled out and left knob pushed in.

SelectAire wiring diagram is shown in Fig. 5.

*(To Be Continued)*

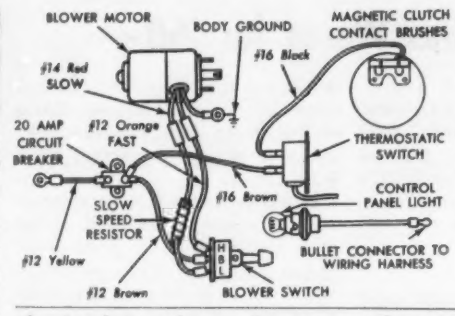



FIG. 5—Wiring diagram of 1959 Ford SelectAire system.

# CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications $10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other address by actual word count. Please send payment with order.

### POSITIONS WANTED

A TWENTY-SEVEN year old graduate engineer, with seven years' experience in the refrigeration and air conditioning field, wishes position as a design engineer or sales engineer. Married and a Korean veteran. Please reply to BOX A6390, Air Conditioning, Heating & Refrigeration News.

FIELD SALES Manager with 15 years of broad experience in residential and commercial air conditioning sales to distributors and dealers, also experienced in sales and application of large central station air conditioning. Well acquainted with Architects and Consulting Engineers in Midwest. Interested in position with aggressive manufacturer, prefer St. Louis area as headquarters, but will relocated depending on offer. Reply BOX A6388, Air Conditioning, Heating & Refrigeration News.

MANUFACTURER'S AGENT with 25 years' experience selling to air conditioning & refrigeration wholesalers & O.E.M. accounts—Has opening for one additional line to this trade—Covering North Jersey & Metropolitan New York—Will attend "All Industry Show" in Atlantic City—Can arrange for interview at show. Use BOX A6372, Air Conditioning, Heating & Refrigeration News.

### POSITIONS AVAILABLE

SERVICE MANAGER qualified to handle heating and air conditioning service department. Must have business ability and knowledge of controls, air balancing, refrigeration and heating. Company operates 14 radio controlled service trucks and does mechanical contracting work also. Send resume to AIR TEMPERATURE, INC., 283 Poplar Avenue, Memphis, Tennessee.

SERVICE MANAGER, wanted by long established air conditioning and heating company doing commercial and industrial work only. Must be experienced with central systems service problems and capable of directing an established department handling regular service and service contracts. Send requirements to: MECHANICAL HEAT & COLD, INC., 12320 Hamilton Avenue, Detroit 3, Mich.

WANTED — MANUFACTURER'S Representatives to handle complete line of replaceable, activated carbon and water washable filters. Most territories now open. Offer liberal commissions. Tremendous opportunity for manufacturer's representatives to increase their sales with this filter line. PERMANENT FILTER SALES, 2202 Norfolk Avenue, Houston 6, Texas.

MANUFACTURER REPRESENTATIVES needed in several Eastern and Midwestern states (without representation at present) to take on line of 46 models automatic icemakers and 3 models automatic slush freezers. Prefer experienced agents with contacts in commercial refrigeration and restaurant and hotel supply trade. Liberal commission set-up. Reply giving full resume of experience and lines currently handled, to POLAR CHIPS MANUFACTURING CO., P. O. Box 4398, Fort Worth, Texas.

WE CAN place a zone sales manager in the commercial refrigeration field, who can sell direct to chains and wholesale grocers as well as supervise established dealers. If you are at the ARI Exposition in Atlantic City, November 2nd through November 5th, stop in at booth number 622 and talk to us. J. S. Twist, SHERER-GILLETT CO., Marshall, Michigan.

DESIGN & development engineer—Experienced in the development of gas fired residential heating equipment. Send complete resume including salary requirements to Harold Rush, STEWART-WARNER CORPORATION, Heating and Air Conditioning Division, Lebanon, Indiana.

AIR CONDITIONING design engineer —Graduate mechanical engineer with two or more years' product design experience. Design air conditioning equipment, co-ordinate manufacture and testing of pilot models. Select and recommend materials and component parts for product. Send complete resume including salary requirements to Harold Rush, STEWART-WARNER CORPORATION, Heating and Air Conditioning Division, Lebanon, Indiana.

AIR CONDITIONING service man qualified to service air conditioning systems. Knowledge of controls, air balancing, refrigeration, and heating components necessary. We are a medium sized air conditioning contractor with exclusive Carrier dealership. Top wages and steady immediate employment to right man. Send resume to THERMODYNE CORP., 1551 Cota Avenue, Long Beach 13, Calif.

HELP WANTED: Refrigeration service man, sober, dependable, preferably married. Salary open. Write A. J. Van Wie, P.O. BOX 1085, Haines City, Florida.

EXPERIENCED SERVICE manager to set up and run service department for commercial, industrial air conditioning, refrigeration and heating. Excellent opportunity for a qualified man. This has unlimited potential earnings. We cover the greater Chicago area. Replies must give past experience, education, age, former employers and all other pertinent information. BOX A6385, Air Conditioning, Heating & Refrigeration News.

ASSISTANT CHIEF engineer. Young fast growing company manufacturing industrial refrigeration requires graduate refrigerating engineer with a minimum of three years' experience. Must know theoretical cycles, heat transfer, piping and compressors. Duties will include design, testing, trouble shooting and preparation of sales literature. Excellent salary with room to grow. Chicago location. Reply in strict confidence with complete resume to BOX A6389, Air Conditioning, Heating & Refrigeration News. Expense paid personal interview will be arranged.

MANUFACTURERS AGENTS operating in northeastern states, with good lines in refrigeration and restaurant equipment fields, need one or two additional assistants to handle small area with 100 mile radius, either full or part time. Excellent opportunity for right man to break into this desirable field. BOX A6386, Air Conditioning, Heating & Refrigeration News.

REFRIGERATION ENGINEER: For manufacturer of air conditioning equipment. Must be experienced in component selection and system design. Background knowledge of sheet metal manufacturing helpful. Salary range $8,500 to $10,500. Position assistant to chief engineer. Medium size well rated manufacturer, middle Atlantic States location. Send resume of background, education, experience; include recent earnings. All replies confidential. Our employees know of this ad. BOX A6387, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEERS—Large manufacturer of central air conditioning, heat pumps, and furnaces, needs regional representatives for Northeast, Midwest, Southwest, and West. Need industry experience, versed in distributor and dealer operation, with background of builder sales experience preferred. Sober, 25-40, hard-working, willing to relocate, travel 5 days. Good salary, expenses, commission scale for top industry pay for results. Send resume, with recent photo, to BOX A6384, Air Conditioning, Heating & Refrigeration News.

SERVICE MANAGER wanted by old established air conditioning & heating contractor in Chicago. Must have the ability to manage a well established existing service department covering commercial and industrial installations and maintenance contracts. Reply BOX A6377, Air Conditioning, Heating & Refrigeration News.

### EQUIPMENT WANTED

WANTED: MANUFACTURERS surplus, outdated or obsolete refrigeration items—expansion & water & shut-off valves, controls, relays, dehydrators, units, tubing, fittings, etc. All sales on a cash closeout basis, large or small quantity. Write or call: COMMERCIAL CONTROLS CO., 257 East 3rd Street, New York 9, New York, ORegon 3-7210.

WE WILL purchase your excess and surplus expansion, water solenoid valves, temperature & pressure controls, fan motors, magnetic starters, relays, hermetic heads, unit coolers—all supplies. Turn obsolete stock into cash, save valuable space. Write, R & R EQUIPMENT CO., 172 Willis Ave., Bronx, N. Y.

### EQUIPMENT FOR SALE

USED BUT not abused refrigerators—Westinghouse—Frigidaire—G.E. 4 cu. ft. Mixed or solid trailer loads. Price del'd to your door approx. $25.00 ea., depending on distance from New York. Larger sizes also available—Slightly higher. AJAX, 9602 Ditmas Ave., Brooklyn 36, New York, HYacinth 8-6121.

AJAX ICE Machine parts—We have purchased the inventory of parts, plus all tooling, for the Ajax Electric Iceman, formerly manufactured by Servel, Inc. We are now furnishing replacement parts, for all models including Ajax Pebble Machine. Catalog & prices available. AJAX EQUIPMENT CO., INC., 73 Pine Street, Montclair, N. J.

7½ & 10 hp. air cooled air conditioners, self contained, heating, other options. Larger sizes to order: Built right and priced right so you can buy right from Bill Mauer, CUSTOM-TEMP CORPORATION, Liberty, New York.

NOTICE: DISTRIBUTORS, dealers, service men, users refrigeration equipment — Repair parts available all models Baker ammonia and Freon compressors. Also Models 6B and F6B ammonia compressors. We are exclusive Baker export sales office. Manufacturers' export agents refrigeration, air conditioning, and allied equipment. THE KEISER COMPANY, 7651 South Ashland Ave., Chicago, Illinois.

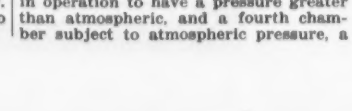
FOR SALE: Air conditioning 2 hp. hermetic compressors—Model HB200 230 V. 60 cy. 1/phase F-22. Complete with electrical "Power Pack". $79.00 ea. F.O.B. Chicago, Illinois, WALTER W. STARR, 2833 Lincoln Avenue, Chicago 13, Illinois.

# PATENTS

## Week of June 23 (Continued)

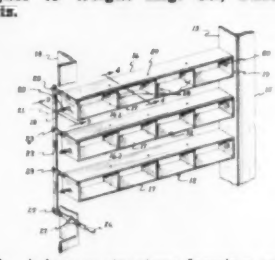
**Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.**

**2,891,461. DIRECTIONAL CONTROL AIR DIFFUSER. Cortland N. O'Day, Port Washington, N. Y.**



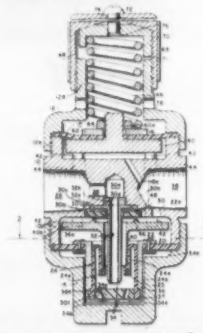
1. In a centralized air distribution system having main and branch air distributing conduits, a directional air control diffuser attached to the end of a branch conduit comprising inner, middle and outer dished plates of decreasing diameter outwardly, said inner and middle plates being mounted on each other by Z-shaped brackets and said middle and outer plates being mounted on each other by bolts and spacer sleeves. . . .

**2,891,462. LOUVER STRUCTURE FOR AIR CONDITIONING GRILLE. Gordon D. Petrie, Phoenix, Ariz., assignor to Wright Mfg. Co., Phoenix, Ariz.**



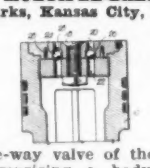
1. A louver structure forming an air discharge grille comprising a frame, a series of louver units each unit comprising upper and lower spaced parallel louver blades rigidly connected together at their ends, means for pivotally mounting the ends of said connected pairs of spaced louver blades on said frame in vertically spaced position to others of said connected pairs at distances substantially equal to the distance between said pair of connected vertically spaced blades. . . .

**2,891,569. TWO-STAGE GAS REGULATOR. Monroe Harry Goodner, Red Bank, N. J., assignor to Stephenson Corp., Red Bank, N. J.**



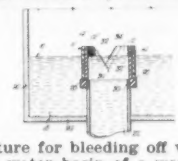
1. A gas pressure regulator comprising, a casing having therein, a high pressure chamber adapted for connection to a supply conduit, an intermediate pressure chamber, a low pressure chamber adapted for connection to an outlet conduit and intended in operation to have a pressure greater than atmospheric, and a fourth chamber subject to atmospheric pressure, a jet conduit interconnecting the high pressure and intermediate pressure chambers, a primary valve member movable toward and away from the discharge end of said conduit to control flow of gas from said high pressure chamber into said intermediate pressure chamber. . . .

**2,891,571. MULTIPLE-BALL VALVE. Van J. Sparks, Kansas City, Mo.**



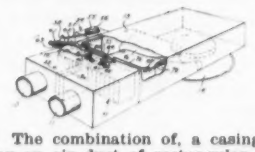
1. A one-way valve of the kind described comprising a body provided with a plurality of elongated, straight, parallel bores therethrough each having an inlet end, a cylindrical inlet stretch adjacent the inlet end thereof, an outlet end. . . .

**2,891,574. BLEED-OFF STRUCTURE FOR COOLING TOWERS. Theodore L. Dahlberg, Chicago, Ill., assignor to Deady Chemical Co., Kansas City, Mo.**



Structure for bleeding off water from the hot water basin of a water cooling tower having an open top pipe extending into the basin through the bottom thereof, a valve within the water in the basin comprising an inner, open top, cylindrical tube surrounding the uppermost end of the pipe and provided with an integral, outturned, upwardly-facing shoulder adjacent the lowermost edge thereof. . . .

**2,891,576. AIR MIXING DAMPER. Walter W. Kennedy, Rockford, Ill., assignor to Barber-Colman Co., Rockford, Ill.**



1. The combination of, a casing defining an air duct of rectangular cross section, a plurality of expansible vanes spanning opposite side walls of said duct and having parallel edges laterally spaced apart across the duct between the other two walls and lying in a plane fixed longitudinally of the duct, said vanes and said other walls defining between them a plurality of parallel passages for flow of air. . . .

*(To Be Continued)*

# ARI's Report on Unitary Air Conditioners

## *Manufacturers Release First Public Figures on Quarterly Shipments*

WASHINGTON, D. C.—Shipments of unitary air conditioners in the first six months of 1959 were up 39% compared with the corresponding period of 1958, according to the first report issued by the ARI Unitary Air-Conditioner Section under its new policy of releasing manufacturer's quarterly shipment figures.

The report was prepared by the Air-Conditioning & Refrigeration Institute in cooperation with the National Warm Air Heating & Air Conditioning Association. Following are the names of reporting companies.

Reporting Companies: Airtemp Div., Chrysler Corp.; Amana Refrigeration, Inc.; American Furnace Co.; American-Standard Air Conditioning Div.; American-Standard Industrial Div.; Arkla Air Conditioning Corp.; Armstrong Furnace Co.; Carrier Corp.; Cleveland Steel Products Corp.; Coleman Co., Inc.; Columbia Specialty Co., Inc.; Continental Mfg. Co.; Coolerator Div., McGraw-Edison Co.; Curtis Mfg. Co.

Fedders Corp.; Florida Warren Corp.; Forston Co.; Fraser & Johnston Co.; Frick Co., Inc.; Friedrich Refrigerators, Inc.; Frigidaire Div., General Motors Corp.; Gaffers & Sattler Div., Utility Appliance Corp.; General Electric Co.; Grove Furnace Co., Inc.; Hall-Neal Furnace Co.; Heil-Quaker Corp.; Holly-General Co.; Gibson Refrigerator Co., Perfection Industries; Typhoon Air Conditioning Co., Typhoon Heat Pump Co., divisions of Hupp Corp.

International Heater Co.; Iron Fireman Mfg. Co.; Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.; Lennox Industries, Inc.; Majestic Co., Inc.; Mathes Co.; Miami Products, Inc.; Mueller Climatrol Div. of Worthington Corp.; National Thermetic Corp.; National-U.S. Radiator Corp.; C. A. Olsen Mfg. Co.; Peerless Corp.; Philco Corp.; Rheem Mfg. Co.

A. O. Smith Corp.; Southwest Mfg. Co.; Stewart-Warner Corp.; U. S. Machine Div.; Thatcher Furnace Co.; Therm-Air Mfg. Co.; Trane Co.; Tuck-Aire Furnace Co.; United States Air Conditioning Corp.; Westinghouse Electric Corp.; Whirlpool Corp.; Williamson Co.; Worthington Corp.; York Div. of Borg-Warner Corp.

* * *

**ARI UNITARY AIR-CONDITIONER SECTION'S CONDENSED SUMMARY BY SIZE OF MANUFACTURERS' SHIPMENTS**

**SECOND QUARTER (April-June, 1959)**

| Size | —By Condenser-Type— Air or Evaporatively Cooled | Water Cooled | Total Units | % Change from 1958 |
|---|---|---|---|---|
| Under 18,000 B.t.u./hr. | 16,655 | .... | 16,860 | + 18 |
| 18,000-26,999 B.t.u./hr. | | 205 | | |
| 27,000-32,999 B.t.u./hr. | 7,316 | 35 | 7,351 | — 6 |
| 33,000-41,999 B.t.u./hr. | 32,085 | 4,665 | 36,750 | + 51 |
| 42,000-53,999 B.t.u./hr. | 9,685 | 90 | 9,775 | + 91 |
| 54,000-64,999 B.t.u./hr. | 12,018 | 5,584 | 17,602 | + 41 |
| 65,000-96,999 B.t.u./hr. | 4,442 | 3,087 | 7,529 | + 36 |
| 97,000-134,999 B.t.u./hr. | 2,047 | 2,314 | 4,361 | + 17 |
| 135,000-184,999 B.t.u./hr. | 261 | 1,234 | 1,495 | + 9 |
| 185,000-249,999 B.t.u./hr. | 121 | 681 | 802 | + 2 |
| 250,000-319,999 B.t.u./hr. | 45 | 496 | 541 | + 33 |
| 320,000-379,999 B.t.u./hr. | 45 | 314 | 359 | +133 |
| 380,000 B.t.u./hr. & over | 24 | 58 | 82 | + 34 |
| **Total** | **84,744** | **18,763** | **103,507** | **+ 37** |

This condensed summary by size includes shipments of:

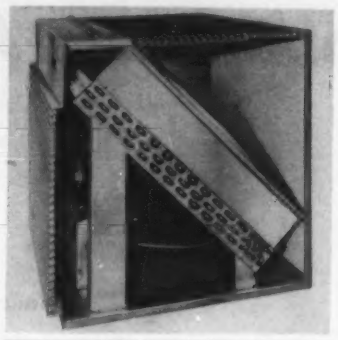
1. Air Conditioners (except window and wall types) With or without condensers and refrigeration chassis.
2. Year-Round Air Conditioners—With or without condensers.
3. Heat Pumps (except room air conditioners). Self-contained and other than self-contained.
4. Split Systems—Air Conditioning Condensing Units **only**. It does **not** include shipments of air conditioning coils with or without blowers.

EXPORT SHIPMENTS—The total figure includes export shipments of 2,222 units for the second quarter.

For Uniform Product Temperature
Cold-Cel
TRUCK PLATES
The "standard" for truck refrigeration
● FASTER PULLDOWN
● MAXIMUM HOLDOVER
● MINIMUM MAINTENANCE
AVAILABLE IN VARIOUS SIZES, THICKNESSES AND EUTECTIC TEMPERATURES
DOLE REFRIGERATING COMPANY
5920 NORTH PULASKI ROAD, CHICAGO 46, ILLINOIS
103 PARK AVENUE, NEW YORK 17, N. Y.
Dole Refrigerating Products Limited, Oakville, Ontario, Canada
Write for Engineering Catalog CE
DOLE
Cold-Cel TRUCK PLATES


### *ARI Unitary Air-Conditioner Section's Report Of Manufacturers Shipments January-June, 1959 (6 months)*

| Description of Product | Total Shipments In Units (By Condenser-type) Air or Evaporatively Cooled | Water Cooled | Total | % Change from 1958 |
|---|---|---|---|---|
| **AIR CONDITIONERS (except window and wall type)** | | | | |
| **Horizontal** | | | | |
| **SELF-CONTAINED (Integral-Condenser Type) (1)** | | | | |
| 18,000-26,999 B.t.u./hr. | 10,519 | 13 | 10,532 | 0 |
| 27,000-32,999 B.t.u./hr. | 1,068 | 1 | 1,069 | |
| 33,000-41,999 B.t.u./hr. | 10,595 | 146 | 10,741 | + 60 |
| 42,000-53,999 B.t.u./hr. | 963 | 1 | 964 | |
| 54,000-64,999 B.t.u./hr. | 294 | 382 | 676 | + 3 |
| 65,000-96,999 B.t.u./hr. | | | | |
| **Other Than Horizontal** | | | | |
| 18,000-26,999 B.t.u./hr. | 3 | 165 | 168 | — 82 |
| 27,000-32,999 B.t.u./hr. | .... | .... | .... | |
| 33,000-41,999 B.t.u./hr. | 4 | 3,668 | 3,672 | |
| No. of Companies 1959 — 48 1958 — 42 — 42,000-53,999 B.t.u./hr. | 27 | 5,358 | 5,385 | — 13 |
| 54,000-64,999 B.t.u./hr. | | | | |
| 65,000-96,999 B.t.u./hr. | 7 | 4,382 | 4,389 | — 10 |
| **ALL** | | | | |
| 97,000-134,999 B.t.u./hr. | 31 | 3,774 | 3,805 | — 19 |
| 135,000-184,999 B.t.u./hr. | 26 | 2,262 | 2,288 | — 6 |
| 185,000-249,999 B.t.u./hr. | 33 | 1,122 | 1,155 | — 21 |
| 250,000-319,999 B.t.u./hr. | 12 | 862 | 874 | + 25 |
| 320,000-379,999 B.t.u./hr. | 11 | 483 | 494 | + 80 |
| 380,000 B.t.u./hr. & over | 33 | 94 | 127 | + 41 |
| **Total** | **23,636** | **22,713** | **46,339** | **+ 2** |
| **REMOTE-CONDENSER TYPE (2)** | | | | |
| 18,000-26,999 B.t.u./hr. | | | | |
| 27,000-32,999 B.t.u./hr. | 391 | | 391 | — 43 |
| 33,000-41,999 B.t.u./hr. | | | | |
| 42,000-53,999 B.t.u./hr. | 327 | | 327 | — 8 |
| 54,000-64,999 B.t.u./hr. | 542 | | 542 | — 30 |
| 65,000-96,999 B.t.u./hr. | 834 | | 834 | + 16 |
| 97,000-134,999 B.t.u./hr. | 469 | | 469 | + 12 |
| No. of Companies 1959 — 14 1958 — 18 — 135,000-184,999 B.t.u./hr. | 386 | | 386 | +144 |
| 185,000-249,999 B.t.u./hr. | 139 | | 139 | |
| 250,000-319,999 B.t.u./hr. | 51 | | 51 | +233 |
| 320,000-379,999 B.t.u./hr. | 50 | | 50 | |
| 380,000 B.t.u./hr. & over | | | | |
| **Total** | **3-189** | **....** | **3,189** | **0** |
| **REFRIGERATION CHASSIS (except shipments to other manufacturers) (3)** | | | | |
| Under 18,000 B.t.u./hr. | .... | .... | .... | |
| 18,000-26,999 B.t.u./hr. | 609 | | | |
| 27,000-32,999 B.t.u./hr. | .... | | | |
| 33,000-41,999 B.t.u./hr. | | | | |
| 42,000-53,999 B.t.u./hr. | .... | 982 | 1,591 | — 29 |
| 54,000-64,999 B.t.u./hr. | .... | | | |
| 65,000-96,999 B.t.u./hr. | .... | | | |
| No. of Companies 1959 — 10 1958 — 12 — 97,000 B.t.u./hr. & over | .... | | | |
| **Total** | **609** | **982** | **1,591** | **— 29** |
| **YEAR-ROUND AIR CONDITIONERS (except heat pumps)** | | | | |
| **SELF-CONTAINED AND REMOTE-CONDENSER TYPE (4)** | | | | |
| Under 18,000 B.t.u./hr. | .... | .... | .... | |
| 18,000-26,999 B.t.u./hr. | | | | |
| 27,000-32,999 B.t.u./hr. | .... | .... | .... | |
| 33,000-41,999 B.t.u./hr. | .... | 6,632 | | |
| 42,000-53,999 B.t.u./hr. | 160 | | 6,792 | + 33 |
| 54,000-64,999 B.t.u./hr. | .... | | | |
| No. of Companies 1959 — 8 1958 — 10 — 65,000-96,999 B.t.u./hr. | .... | | | |
| 97,000 B.t.u./hr. & over | .... | .... | .... | |
| **Total** | **160** | **6,632** | **6,792** | **+ 33** |
| **HEAT PUMPS (except room air conditioners)** | | | | |
| **SELF-CONTAINED (5)** | | | | |
| Under 18,000 B.t.u./hr. | .... | | .... | .... |
| 18,000-26,999 B.t.u./hr. | 3,701 | | 3,701 | +223 |
| 27,000-32,999 B.t.u./hr. | 512 | | 512 | |
| 33,000-41,999 B.t.u./hr. | 4,831 | | 4,831 | |
| No. of Companies 1959 — 16 1958 — 12 — 42,000-53,999 B.t.u./hr. | 394 | | 394 | + 46 |
| 54,000-64,999 B.t.u./hr. | | | | |
| 65,000-96,999 B.t.u./hr. | 388 | | 388 | |
| 97,000 B.t.u./hr. & over | | | | |
| **Total** | **9,826** | **....** | **9,826** | **+ 91** |
| **OTHER THAN SELF-CONTAINED (6)** | | | | |
| Under 18,000 B.t.u./hr. | .... | | .... | .... |
| 18,000-26,999 B.t.u./hr. | 902 | | 902 | |
| 27,000-32,999 B.t.u./hr. | | | | |
| 33,000-41,999 B.t.u./hr. | 2,000 | | 2,000 | |
| 42,000-53,999 B.t.u./hr. | 2,549 | | 2,549 | +119 |
| No. of Companies 1959 — 13 1958 — 5 — 54,000-64,999 B.t.u./hr. | | | | |
| 65,000-96,999 B.t.u./hr. | 392 | | 392 | |
| 97,000 B.t.u./hr. & over | 181 | | 181 | |
| **Total** | **6,024** | **....** | **6,024** | **+119** |
| **SPLIT SYSTEMS** | | | | |
| **AIR CONDITIONING CONDENSING UNITS (7)** | | | | |
| Under 18,000 B.t.u./hr. | 9,758 | .... | 9,774 | + 86 |
| 18,000-26,999 B.t.u./hr. | | 16 | | |
| 27,000-32,999 B.t.u./hr. | 9,967 | 45 | 10,012 | + 46 |
| 33,000-41,999 B.t.u./hr. | 30,873 | 94 | 30,967 | + 61 |
| 42,000-53,999 B.t.u./hr. | 11,779 | 151 | 11,930 | +100 |
| No. of Companies 1959 — 52 1958 — 35 — 54,000-64,999 B.t.u./hr. | 15,428 | 255 | 15,683 | + 61 |
| 65,000-96,999 B.t.u./hr. | 5,941 | 97 | 6,038 | + 49 |
| 97,000 B.t.u./hr. & over | 2,547 | 79 | 2,626 | +163 |
| **Total** | **86,293** | **737** | **87,030** | **+ 67** |
| **AIR CONDITIONING COILS WITH BLOWER (8)** | | | | |
| Under 18,000 B.t.u./hr. | | | .... | |
| 18,000-26,999 B.t.u./hr. | | | 617 | + 10 |
| 27,000-32,999 B.t.u./hr. | | | 501 | + 76 |
| 33,000-41,999 B.t.u./hr. | | | 3,605 | + 64 |
| 42,000-53,999 B.t.u./hr. | | | 2,700 | |
| No. of Companies 1959 — 34 1958 — 23 — 54,000-64,999 B.t.u./hr. | | | 5,376 | + 47 |
| 65,000-96,999 B.t.u./hr. | | | 3,650 | + 64 |
| 97,000 B.t.u./hr. & over | | | 2,338 | +281 |
| **Total** | | | **18,787** | **+ 68** |
| **AIR CONDITIONING COILS WITHOUT BLOWER (9)** | | | | |
| Under 18,000 B.t.u./hr. | | | .... | |
| 18,000-26,999 B.t.u./hr. | | | 5,615 | + 17 |
| 27,000-32,999 B.t.u./hr. | | | 4,876 | +118 |
| 33,000-41,999 B.t.u./hr. | | | 21,859 | + 74 |
| 42,000-53,999 B.t.u./hr. | | | 8,275 | |
| No. of Companies 1959 — 35 1958 — 24 — 54,000-64,999 B.t.u./hr. | | | 9,062 | + 50 |
| 65,000-96,999 B.t.u./hr. | | | 3,731 | + 64 |
| 97,000 B.t.u./hr. & over | | | | |
| **Total** | | | **53,418** | **+ 64** |
| **Grand Total (excluding coils)** | **129,727** | **31,064** | **160,791** | **+ 39** |



RIGHT: Janitrol's new 52 series outdoor compressor-condenser features larger condensing coils that are said to dissipate more heat and provide greater efficiency. They're positioned diagonally in the cabinet for more efficient arrangement of components.

LEFT: The new Janitrol outdoor compressor-condenser has a cabinet of simple rectangular design with a soft frost-green finish that is said to blend with any landscape plan. All exhaust air flows upward so that hot blasts do not affect plants.

# Janitrol--

*(Concluded from Page 1, Col. 4)*

featuring a gold-tone front grille which make them resemble a hi-fi speaker cabinet.

The new condensing units are available in sizes of 2, 3, 4, 5, 7½, and 10 tons plus combinations to provide 15 and 20-ton units.

Over-all industry sales for 1959 will find such split systems accounting for 52% of the market for unitary equipment, compared with 11% in 1954, a Janitrol executive predicted.

The get-together festivities began with the President's Reception Sunday, Oct. 25, where R. A. Bell, president of the Janitrol Div. and executive vice president of Surface Combustion Corp. was host.

On Monday morning at Veteran's Memorial Auditorium, the group was welcomed by H. C. Gurney, general sales manager.

W. R. Egan, western regional manager for Janitrol, introduced the company's completely redesigned No. 67 series unit heater. With its clean-line design, Egan said, the new unit blends with smart business settings and the decor of any style commercial or industrial building.

J. Thomas Calhoon of the advertising staff, K. G. Hull, eastern regional manager, Dale J. Alcorn and A. H. Rotsinger of Beeson-Reichert, Inc., Janitrol's advertising agency, revealed 1960 merchandising and advertising plans for the new unit heaters.

Tours of the Janitrol plant at 400 Dublin Ave., were made Monday afternoon.

Presentation of the new line of condensing units was made Tuesday morning in a special address by Bell, the division president, following which merchandising, advertising, and promotion plans were outlined by C. C. Owen, national field sales manager; Paul A. Ryan, advertising and sales promotion manager; T. J. Williams, marketing services manager; and R. E. Ireland and Ray F. Horan of the advertising department.

Industry sales of 1,500,000 furnaces in 1960 were predicted by L. J. Monahan, central regional sales manager, in an afternoon session where he also revealed Janitrol is aiming to get between 8% and 10% of this growing market within two years.

Dealers were also told that this year the company's "special closer" aimed for mid-winter furnace sales will be a "package" consisting of Honeywell indoor and outdoor thermostats plus a "filter flag" sold to dealers at $23 (minus $9 for the replaced thermostat), permitting dealers to give the three items away to get off-season sales.

Engineering changes in the new condensing unit include use of condensing coils of greater area, positioned diagonally in the cabinet for a more efficient arrangement of components.

The cabinet is of simple rectangular design and has a soft frost-green finish that blends harmoniously with any landscape plan. All exhaust air flows upward so that hot blasts do not affect nearby plantings.

Cabinet design permits any desired number of the 52 series units to be installed side-by-side with zero clearance between. This provides an economical method of obtaining a variety of high-capacity cooling combinations through the use of standard models, the company says.

Janitrol engineers claim the compressor and fan are unusually quiet in operation. The cabinet is acoustically treated with a weatherproof, sound-absorbent material and the fan is mounted on rubber cushions.

For easy service, all components of the new unit are readily accessible from the front. The large front panels may be removed without motor shut-off so the unit can be checked while in full operation.

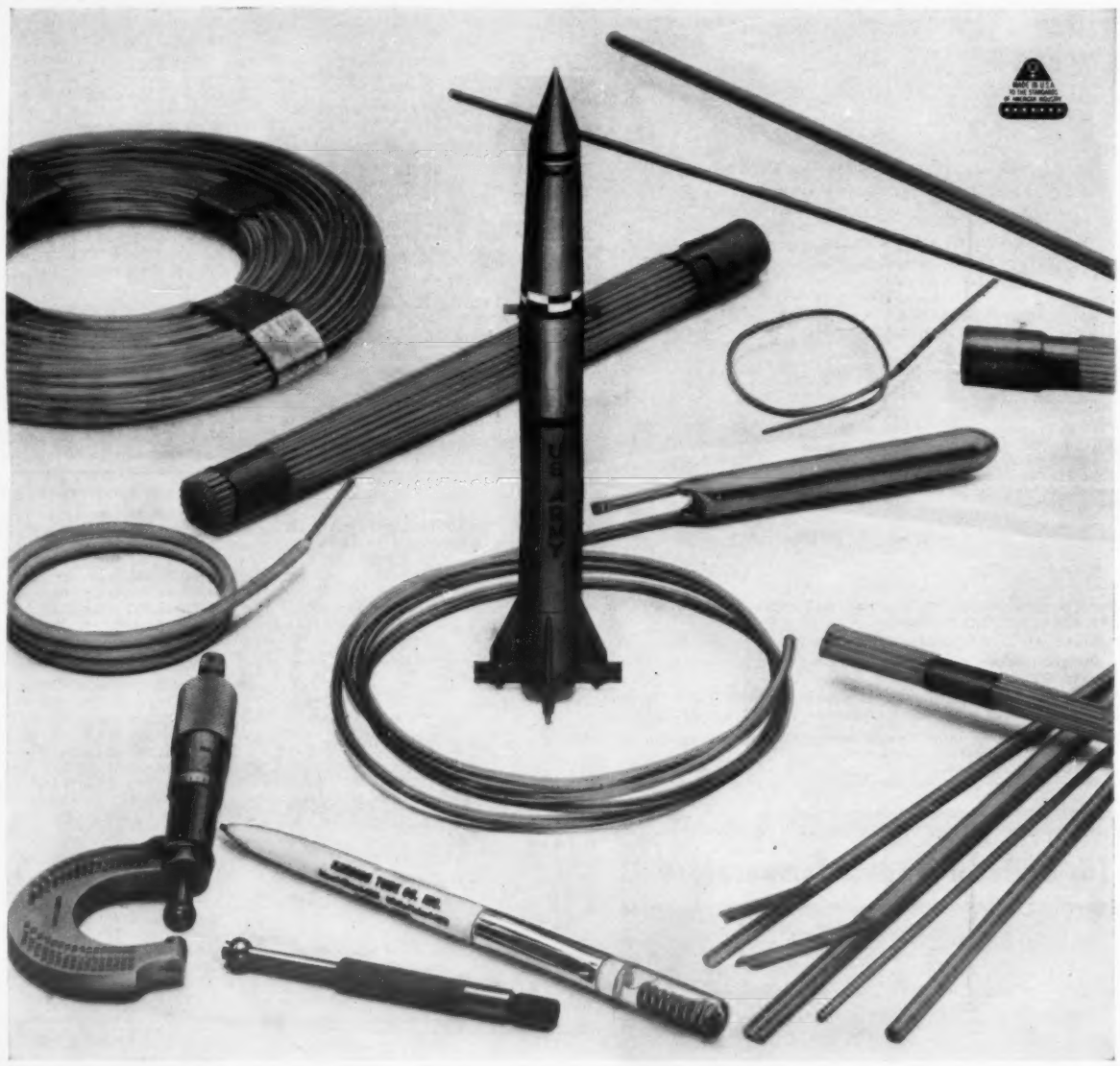
The new 52 series unit capacities are certified by the Air-Conditioning & Refrigeration Institute, and carry a five-year written warranty.

Known as the 67 series, the new gas unit heaters feature cabinets with a trim-square, functional configuration, with smooth side panels free of the conventional grilles that have long been a characteristic part of the unit heater design.

The heaters are said to feature quiet air delivery which makes them ideal for applications where many conventional units are too noisy. Controls are completely automatic, factory assembled and wired, and though concealed from view in an enclosure, they are readily accessible for servicing, when needed.

All of the new units have a limit control which interrupts the automatic control circuit and shuts off fuel if the unit temperature becomes excessive. The thermo-pilot shut-off automatically closes off all gas, including the pilot, in the event of pilot failure.

There are 11 new models with a B.t.u. per hour input range of 30,000 to 250,000.



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